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ORIGINAL ARTICLES.

SUBDIVISIONS OF THE CONCRETE CONCEPT AREA OF THE HUMAN CEREBRUM.*

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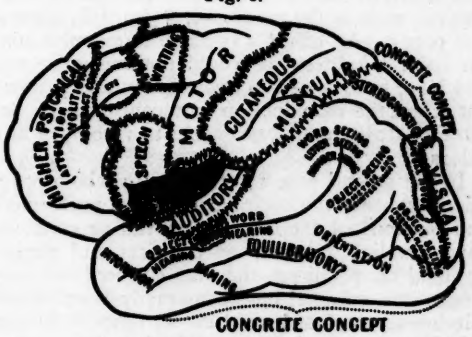
IN a previous paper[1] I have suggested that the term "concrete concept area" should be applied to the parietotempero-occipital region which lies between the projection areas of the cortex and largely corresponds to the great posterior association area of Flechsig. In another contribution[2] I have indicated my views as to the subdivisions of this area, which I first made to include the muscular sense, stereognostic perception, word seeing, letter seeing, number seeing, object seeing, orientation, naming, object hearing, word hearing and intonation. It is doubtful whether the muscular sense should be included in this area, and on further consideration I have decided to relegate it to the primordial regions. It belongs either here or in a position of its own between cutaneous sensibility and stereognostic perception. In the present paper I shall confine myself chiefly to a consideration of several of the sub-areas of the great concrete concept region, namely, those for object seeing and intonation, with some discussion of the cortical representation of color recognition.

Under such designations as mind blindness, soul blindness, object blindness and visual pragmetagnosia (Wyllie[3]) is described a condition in which the individual, because of a cerebral lesion or disease, is unable to recognize by sight once familiar objects. Old visual memories of the kind required for recognition of particular objects are no longer recalled. I shall not enter into any discussion of the refinements of this interesting subject, as this is foreign to my present purpose. In a note to my recent article in the *University of Pennsylvania Medical Bulletin*, May, 1904, on the physiologic areas and centers of the cerebral cortex of man, I indicated my belief that the cerebral area for object seeing was a large one and probably subdivided, especially in highly civilized man, into several subareas or centers of representation such as those for geometric and architectonic forms and for persons, places and natural objects (Fig. 1). Very few cases of object blindness with necropsy have been recorded.

In order that object blindness shall be complete and permanent, the recorded cases would seem to show that it is necessary for lesions to be present in somewhat corresponding locations in both hemicerebrums. Transient or recurring object blindness is, however, sometimes exhibited by patients with a lesion confined to one hemisphere. In twenty-five cases of otitic abscess involving the left temporal lobe, compiled by Merkens,[4] such mind blindness was present. Two cases of transient or recurring mind blindness have recently fallen under my observation. In both of these cases operation was performed for the removal of a brain lesion, presumed to be a tumor, although in one case at least the result did not confirm this opinion. In this case the patient presented in the right half of the body disorders of sensation, stereognosis and coordination. He was partially word deaf, word blind and letter blind, and late in the case showed marked hemiparesis. The operation was performed with the view of exposing the brain at the posterior extremity of the first temporal convolution. A large patch of necrotic tissue,

Fig. 1.



Areas and centers of the lateral aspect of the human hemicerebrum, showing especially the subdivisions of the concrete concept area.

having somewhat the shape of a pyramid with its base toward the occipital pole of the brain, was uncovered. The lesion may have extended further than was revealed by the operation. It not improbably included the caudal extremities of the first and second temporal convolutions, and possibly more.

The operation was performed four years prior to the writing of this paper, and the patient is still living and in fair health, but is hemiplegic, partially hemianesthetic and asphasic. He suffers at times from curious attacks which can properly be described as periods of mind blindness or object blindness. The day before reading this paper I re-examined this patient. I found that his hemiplegic condition had gradually become worse, the paralysis having visibly increased, especially during the last year. He showed some slight improvement in the ability

*Read before the Philadelphia County Medical Society, May 25, 1904.

to name objects looked at, also in being able to say many words. He could not, however, form phrases or sentences. He seems still to be partially word deaf, being thrown into confusion in trying to understand much that was said to him. He continued largely word blind, but recognized an occasional word, writing being understood rather better than printed matter.

His wife who accompanied him stated that beginning about two months after the operation the patient had at irregular intervals spells of temporary mind blindness or object blindness. In these, which would last from a few minutes to one or two hours, while he would seem to know his wife, he was apparently unable to recognize others. In these attacks also he appeared unable to recognize objects or his surroundings; he seemed dazed, would look around as if wondering who the persons and what the objects around him were, repeating almost constantly one word, "What, what." He could not understand anything that was said to him at the time of these spells, and became greatly confused and irritated. His wife said that he remembered these spells after they passed off, and would say "Awful, awful," as if in great dread of them. Examination showed that he understood the use of most objects, such as the telephone, a pen, ink, shears, and paper. An effort was made to examine him for color blindness; he could not recognize red and blue, but seemed to know green and yellow; but when the examination was continued he became confused and was unable to recognize any colors.

In the second case referred to, in which operation exposing the occipital lobe was performed, and portions of the cortex removed or contused corresponding to parts of the first and second occipital convolutions, the man suffered not only from optic aphasia, but temporarily from object blindness. At first he did not at times fully recognize persons and things. The impairment was only partial.

Liepmann has recently reported a practically uncomplicated case of mind blindness. It was first recorded clinically in 1902.[5] The patient, a music teacher, aged fifty years, had an apoplectic attack September, 1901. After this he did everything in a reverse or foolish manner, as for instance, washing in his soup. He did not recognize large objects, nor his own reflection in the mirror, but recognized persons by the voice. He did not know his own wife by sight; color perception was much disturbed. A small defect was present in the upper right quadrant of the visual field; vision was two-thirds. He could imitate large movements fairly well. Well-known objects were often wrongly named. Recognition through touch was slightly disturbed, but through hearing was normal. Motor aphasia was absent, as was also sensory aphasia, unless his wrongly naming objects might be so considered.

The patient died in 1904, two years after the case was first recorded by Liepmann. A necropsy showed most interesting results. Lesions were found on both sides of the brain, on the left in the lower occipital convolutions and on the right in the angular and second occipital convolutions.[6] at the base of the left occipital lobe was a deep cavity which indicated an area of softening, involving the fusiform and lingual convolutions. In the right hemicerebrum the area of softening was on the convexity and extended from the angular gyre through the gray and white matter of the second occipital gyre.

A case reported by Sereiux[7] is of value, notwithstanding the complication of object blindness with other symptoms like word blindness. This case, which was published in 1891, is cited by Wyllie. The patient was a woman sixty-two years old, who in 1888 had a temporary paralytic attack with lasting visual disturbances, and in 1890 had a second seizure with epileptiform spasms, hallucinations of hearing, and delirium. When examined six months later she was word blind, agraphic, word deaf, and paraphasic. She also showed marked mind blindness, with intact general intelligence. She was unable to recognize her nearest relations, said that the people around her seemed to be wearing masks, and that her daughter's face appeared as "flat as a skate." The object blindness was most marked with regard to faces, although exhibited in less degree with reference to other things. She could recognize some objects but not others; a comb, for instance, was mistaken for a pen-holder. She died of pneumonia a few months after observations of Sereiux were made. At the autopsy lesions were found in both hemispheres. In the left hemisphere were present patches of softening and in the supramarginal (subparietal) gyre, and in the caudal extremity of the first temporal gyre; on the right were large areas of softening involving the angular and supramarginal gyres, and also the caudal extremities of the first and second temporal.

So far as is known to the writer, the few other cases of mind blindness which are recorded are not of equal value with those of Liepmann and of Sereiux, but all point to the existence of centers for object recognition by sight in the tempero-occipital convolution from the second to the fourth or fifth.[8]

Studies of the brains of men noted for their powers of observation in special directions, as for instance, distinguished artists, architects, engineers, astronomers, and explorers, also of the brains of those known to have had unusual capacity in mechanical pursuits or in those callings which demand quick powers of recognition of persons and places, may eventually afford some facts of value with regard to the development of the brain in the regions in which object recognition has been localized by the above pathological findings. A comparison of such investigations with the results of the examinations of different and lower types of

brain will make these observations of especial value. E. A. Spitzka's study of the brain of Major J. W. Powell is of great importance in this direction, not only for what it teaches, but also for what it suggests as possible to future investigators. The brain of Major Powell was highly developed in the concrete concept region, and it was even possible to indicate special subareas of high development in particular portions of this region.

Spitzka in his contribution on the brain of Major Powell gives briefly the objects and history of similar examinations of the brains of notable persons.[9] The value to science of such investigations depends upon the principle that elaboration of brain structure is proportionate to the degree of intelligence. The reader interested in the subject is referred to Dr. Spitzka's paper for a most interesting historical résumé of the work done from the time of Rudolph Wagner (1860). Spitzka confines himself in his review to the question of brainweight and surface morphology of the cerebrum.

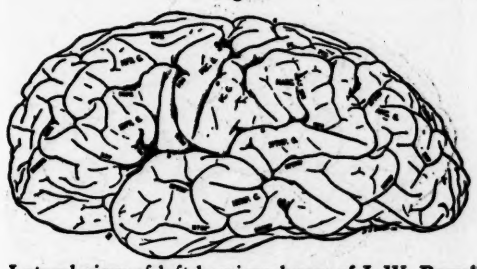
The underlying principle in the efforts to correlate the anatomy and morphology of the cerebral surface with grades of intelligence and capacity is to be found in the statement made by Spitzka that "the cortical expanse of any given area increases with the rise in functional dignity of that area." The supremacy of man over the anthropoids is expressed in the greater size and complexity of the brain of the former. Spitzka emphasizes the fact that the peculiarity of the human brain is to be found in the unusual development of the association areas and tracts—of the parietotempero-occipital concrete concept area and the prefrontal higher psychical region; he roughly estimates these areas as constituting two-thirds of the human cerebral cortex. The studies of the brains of men notable for their intellectual attainments, from Wagner's investigation of the brain of Gauss, the mathematician, in 1860, down to the recent examinations of the brains of the Seguins and of Powell by Spitzka, all indicate greater elaboration of these areas, and the finer recent work shows unusual development of particular subdivisions of these areas.

In general terms, as has already been intimated, unusual elaboration and complexity of fissures and gyres, especially in the intermediate and higher psychical areas, are the expression of unusual or at least highly specialized mentality; but this is a rule not without exception, as is illustrate by Wilder's[10] study of the brain of Chauncey Wright, with its simple fissures, broad gyres and bridged central fissures. In some higher type brains it may be that a large cortical field is obtained by broad convolutions and deep fissures and sulci rather than by the development of secondary fissures and gyres, and that in such brains the cortical layers are relatively richer in cellular elements than is the case in the more elaborated brain.

Spitzka in his paper on the brain of Powell discusses the relation of certain cortical areas to the doctrine of cerebral localization from the standpoint of the morphological and anatomical study of the cerebral surface, in particular directing attention to the correlations between special cerebral areas and the faculty of speech.

The present paper is concerned especially with the presentation of the broad features of the subdivisional localization of the concrete concept region. A large part is devoted to the demonstration of the existence of these subareas by the recital of clinicopathological cases, but in order to emphasize the importance of gyral and fissural studies, in adding to our knowledge of psychic localization, I shall presently briefly compare a few of the observations of Spitzka with some observations made and published by the writer about eighteen years ago. My studies were made on the brains of criminals, paranoiacs, idiots, and negroes, and in a single instance, jointly with the late Dr. A. J. Parker, on the brain of a Chinaman. Both before and since the publication of the papers containing these observations, I made many examinations of human brains of average and of low type, with results which have confirmed me in the views expressed in these publications as to the value, when our methods are more perfected, of such studies in adding to our knowledge of cerebral function and of many cerebral disorders, particularly those which indicate arrested or irregular psychical development. The correct method of applying morphological and anatomical studies of the human brain to cerebral localization is by a comparison of brains of the low, high, and average type with each other, and these with the brains of animals lower in the scale than man, and especially with those of the anthropoids.

Fig. 2.

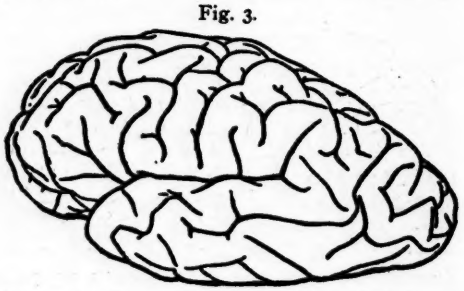


Lateral view of left hemicerebrum of J. W. Powell. This half is slightly flattened on the dorsum. One-half natural size. (E. A. Spitzka).

In Fig. 2 is presented, by permission of Dr. Spitzka, a lateral view of the left hemicerebrum of the brain of Major Powell. Both cerebral hemispheres presented a high general development, and some unusual local peculiarities; for the purposes of this paper it is best to recapitulate these in the language of Dr. Spitzka. In Major Powell's brain the most notable fea-

tures are: (*a*) "The weight of the brain, 1,488 grams, which, for a man of small frame aged sixty-eight and a half years is well above the average; (*b*) a superior degree of fissural complexity and flexuosity of the gyres not affected by the atrophy accompanying old age; (*c*) a superior degree of differentiation of the left subfrontal gyre, (*i.e.*, emissary speech center) as compared with that of the right; (*d*) the left insula (*i.e.*, associative center for the speech faculty) exhibits a slightly superior differentiation; the pre-insular pole is much more prominent than on the right, and the total size is somewhat greater; (*e*) great redundancy of the subparietal regions (*i.e.*, marginal, angular, and postparietal gyres on the right side, encroaching considerably upon the Sylvian cleft; (*f*) preponderance of right frontal lobe (mesal surface) over the left, and a proportionate reduction of the right cuneus-precuneus as compared with the left; (*g*) the precentral gyres are much wider and more massive than the postcentral; (*h*) the supertemporal fissures are interrupted at about the same site on both sides; (*i*) the epiphysis (pineal body) is unusually large." (Spitzka.)

Fig. 3.



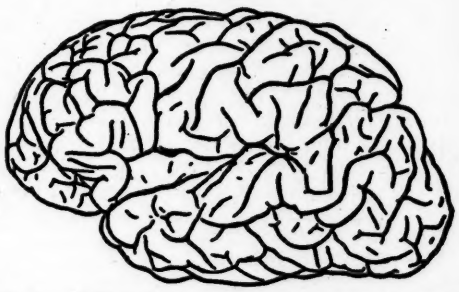
Brain of a Papuan (drawn by E. A. Spitzka from a specimen in the Anatomical Museum, Columbia University).

It will be seen that both the concrete area, including the cerebral zone of speech, and the higher physical regions of the prefrontal lobe, were especially developed. Unusual extent and elaboration of fissures and convolutions were particularly marked in some portions of the parietotempero-occipital association region, and Spitzka correlates these with well-known mental characteristics of the man as determined by opinions obtained from those who knew him best and were best fitted to judge. "The power which chiefly characterized Powell's intellectual ability was" (as would be inferred from his highly developed concrete concept region), "that of seeing analogies and making comparisons, of coupling observations and thoughts which to most people seemed not at all related to each other until by him placed in a certain light. With him the conception of the concrete outweighed thought in the purely abstract (the function, chiefly, of the frontal association areas)." (Spitzka).

A comparison of the illustration showing the left lateral aspect of Powell's brain with that of Papuan (Fig. 3) shows at a glance the extraordinary difference both in size and elaboration of the intermediate and higher psychical regions in the two specimens.[11] The brain of Helmholtz, the great physicist (Fig. 4) shows unusual elaboration both of the prefrontal and the posterior association regions.

In Figs. 5, 6 and 7 are shown photographs of three aspects of the brain of Alexander Winchell,

Fig. 4.



Brain of Helmholtz (after Hansemann). (E. A. Spitzka.)

LL.D., the distinguished geologist, educator and scientific author. For the opportunity of reproducing these photographs I am indebted to Wm. J. Herdman, Ph.B., M.D., Professor of Diseases of the Mind and Nervous System in the University of Michigan.

Studying and comparing the views of the lateral aspects of the left and right hemicerebrums, shown in Figs. 5 and 6, fissural and gyral

Fig. 5.

Lateral aspect of the left hemicerebrum of Professor Winchell.

complexity on both sides is evident, secondary gyres and fissures abounding. The first, second, and third frontal gyres on the right, although considerably convoluted, are well demarcated. This is not altogether the case on the left. The central fissure and the precentral and postcentral fissures and convolutions of both hemispheres are relatively simple, both the fissures and gyres are deep and wide, and the convolutions massive. The left central fissure is long and

deep, and apparently not quite confluent with the Sylvian.

Blurring of the photograph of the left hemisphere in the parietotemporal region interferes with the study of it, but some complexity is evident, especially in the supramarginal and angular region. A real study of the characteristics and peculiarities of the brain surface cannot be made from photographs, however good, and I have indicated only a few of the many interesting features which seem to be presented by the lateral and occipitoparietal aspects of the brain of Professor Winchell, which is evidently worthy of elaborte study such as has been given by Spitzka to the brain of Powell, of the Seguins, and of others.

In the illustration Fig. 7 is shown an occipital or occipitoparietal view of both hemispheres. It is of value, showing as it does at a glance, the unusual difference in the fissural and gyral arrangement and elaboration between the two hemispheres in this region. On the right the parieto-occipital region is extremely and very peculiarly

Fig. 6.

Lateral aspect of the right hemicerebrum of Professor Winchell.

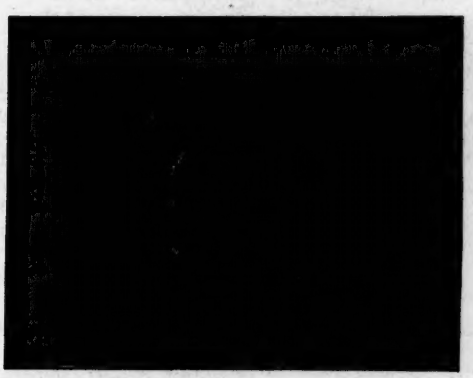
convoluted. The demarcation of the typical convolutions on the left is more readily made out, the fissures and gyres here, while not of simple type, having apparently less deviations. This occipital view impresses one with the idea that the two hemispheres could hardly have belonged to the same individual.

Dr. Herdman in the letter which accompanied the photographs, says of Professor Winchell that his linguistic power was somewhat unusual; he was a good Greek, Latin and Hebrew scholar, and spoke German and French fluently; also that he was a man who was very methodical in his acquisitions, and one who could readily avail himself of the knowledge that he had acquired as occasion demanded.[12]

From his boyhood Professor Winchell was a close student, both of nature and of books; he was skilful in the use of his eyes and hands, being a good offhand draughtsman and manipulator of geological tools and scientific instruments; he was a prolific writer, particularly on geological subjects, his writings showing him to be not only an excellent observer and investigator, but also one possessed of a scientific imagination and reasoning powers of a high order.

In the *Journal of Nervous and Mental Disease* for September-October, 1886, and in *The Philadelphia Polyclinic* for September, 1886, the writer described the peculiarities of the fissural and gyral development in the brains of several criminal paranoiacs, giving photographic illustrations of different aspects of the brains in these cases. A valuable lesson is to be learned by comparing these illustrations with the projection drawings of Spitzka in the left hemispheres of the brain of Major Powell and of the Papuan, and with Hansemann's illustration showing the same side of the brain of Helmholtz. Striking differences are readily made out between the anterior and posterior association areas of the high and the low type brains respectively. Writing in 1886, I summarized as follows the most important indications of inferior development shown in one of the brains described as the comparatively simple type

Fig. 7.



Occipitoparietal view of the brain of Professor Winchell.

of the frontal lobes, the partial exposure of the insula, the confluence of the right central with the Sylvian fissure; the confluence, almost complete, of the right and less perfect on the left of the calcarine with the hippocampal fissures, the ape-like similarities shown by the annectant gyres on both sides, the shallowness, shortness and complete bridging of the right calcarine fissure, the imperfect angular gyre of one side, and the simplicity of the tempero-occipital and parieto-occipital regions.

Writing years before the observations of Flechsig, of Wilder and of Spitzka were published, it is interesting to note what is said about the simplicity and the aberrancy of the tempero-occipital and parieto-occipital regions in another low type brain. Many ape-like peculiarities were shown in the gyres and fissures generally, these being especially marked in the parietotempero-occipital region. The markings of the frontal lobes of both hemispheres in this

brain were simple; the intraparietal fissure was unusually long and only partially bridged; the supramarginal (subparietal) gyre was small; the superior and inferior annectant gyres were somewhat aberrant. Wernicke's fissure (the homologue of the external perpendicular fissure of the ape) was clearly outlined, communicating with the supertemporal fissure, and other interesting peculiarities indicating low psychical development were present.

Some of the conclusions reached in the papers above cited, both from a general study of the subject and the investigation of the low type brains, with regard to the peculiarities which probably indicate a low or aberrant order of human brain, are of interest in connection with our localization studies of the high and intermediate psychical areas, and also have especial interest by contrast in reviewing the work done by Spitzka and others on the brains of those high in the intellectual scale. The subject is fairly well covered in the following citation: "In general, simplicity of structure, with well-defined and comparatively little-complicated fissures and gyres, point to a low type; simplicity of the frontal fissures and gyres in particular indicates an inferior order of brain. Unusual symmetry and atypical asymmetry are indicative of a low type. Normal human brains present atypical asymmetry."

Coming to special details, Benedikt refers to a fissure, which he terms the external orbital, very constant in apes, and, not commonly distinct in the human brain, but rarely absent in criminals' brains examined by him. Partial or complete uncovering of the insula, that is, its exposure to sight without pulling apart the margins of the Sylvian fissure, is to be expected in white brains of inferior grade. The Sylvian fissure in the average brain is of moderate length; the higher the type, other things being equal, the more likely it is to be short. The central fissure in inferior types will be less sinuous, and less likely to be fully separated above from the sagittal or longitudinal fissure and below from the Sylvian. In poorly developed hemispheres the gyres bounding the central fissure will not be sinuous and complicated—that is, will present little elaboration. An unusually well-defined, elongated, or unbridged parietal fissure; a small marginal gyre, as when the parietal fissure approaches closely to the Sylvian; a much elongated so-called retrocentral (postcentral of Wilder) fissure; and an occipital fissure which opens well out on the lateral surface, with the superior *pli de passage* below the brain level, are probably indications of inferiority.

Shortness of the Sylvian fissure, in more highly evolved brains, tends to confer a corresponding shortness in the temporal lobe; the opposite is seen in brains but little evolved. Other peculiar conditions of the temporal lobe seem to be indicative of low type; as great length, particularly of the posterior vertical arm of the supertemporal or parallel fissure, with a tendency to confluence with the Sylvian, occipital, or parietal fissure. Such a tendency indicates a lack of development of Gratiolet's transition gyres of the tempero-occipital and parieto-occipital regions. On the median surface of the hemisphere, some indications of inferiority are smallness of the paracentral lobule and precuneus, confluence complete or incomplete of the calcarine and hippocampal fissure, and unusual definition of the median portion of the occipital fissure, although curiously, in a few brains of low type an unusual development of the so-called gyre of the cuneus, or inferior internal *pli de passage*, is observed. This is an aberrant or peculiar condition, certainly not usual in the average human brain."

The question of the existence of separate cerebral centers for color, luminosity and form is one which deserves consideration in connection with the particular subject of the present paper. If special centers for color exist, they are probably just within or just outside of the primary visual areas for light, in other words, within or on the borders of the cuneus and the first occipital convolution. A few facts of physiology and of clinical medicine seem clearly to indicate the existence of such centers. A few cases of unilateral congenital color blindness have been put on record. In some of these red and green have been confused as in the more usual cases of bilateral color blindness. In other instances the unilateral color blindness has been total. The unilaterality of the symptom is in itself suggestive of the special localization for color representation.

Occasionally color blindness is associated with hemianopsia, or with quadrant or sector defect, in other cases, more interesting in connection with the subject of color representation, hemiachromatopsia is present without hemianopsia.

Two of the most interesting cases of achromatic defect with lesions of the brain demonstrated by necropsy are those of Brill and of Verrey. As the case of Brill, although reported twenty-two years since, has received little or no attention from writers on the subject, and as it is a case of unusual interest, I shall refer to it in some detail.

The patient, a man sixty-three years old in October, 1881, had an apoplectic attack resulting in right hemiparesis, right hemianesthesia, incontinence of urine, and increased right knee-jerk. After several weeks these symptoms were changed and supplemented; the anesthesia of the thigh became hypesthesia, tremor of the paralyzed side developed, and the patient suffered from headache, restlessness and insomnia, with occasional spells of tinnitus aurium and dazing, and also dulness of mind. His sight became dull and hazy. Four months after the attack the patient was examined by Dr. Brill and Dr. E. C. Spitzka in consultation. He failed to recognize green; he was doubtful as to whether violet was greenish or bluish; green he said was red or

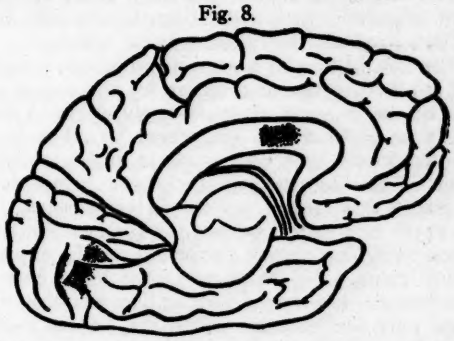
rather pinkish; he could always recognize red and yellow. The color loss involved both eyes. Gross objective vision was retained except a subjective blurring; the fields of vision were not limited. The patient was illiterate so that his condition as to letter and word blindness could not be determined. He had worked on the railroad for thirty years before his illness, and was able to recognize all colors.

He died about 6½ months after admission to the hospital. At the necropsy a softened area was found at the apex of the left cuneus and the adjoining upper part of the lingual convolution. Brill exactly describes the area of softening as follows: "The focus was triangular, the apex being directed forward and the short side posteriorly. It extended to within a centimeter and a half of the apex of the occipital lobe, and involved half the altitude of the cuneus in the middle of the latter, and almost the entire apex of this lobe. The gyrus lingualis was involved for about one-quarter of its width on the surface, and evenly from the posterior almost to the anterior extent of the lesion described. The calcarine fissure could not be identified excepting its most anterior extremity, and even at this spot both borders were softened.[13] At its lowest border the softening reached almost to the posterior cornu. Brill cites chiefly from Exner's work[14] on cerebral localization, cases of Exner, Vaultier, Fürstner, Reinhard, Quaglino, Boys de Lory and Förster.

Verrey reported sixteen years ago the most interesting case of hemiachromatopsia with necropsy, showing the lesion to which the loss of the chromatic sense was due, which has yet been put on record.[15] The patient was a woman sixty years old, whose symptoms were difficulty in reading, with good general visual acuity, slight concentric contraction of the field, complete absolute right hemiachromatopsia, and a sensible diminution of visual acuity for the right half of the visual field. The patient had paroxysmal headache and attacks of vertigo with vomiting. She gradually developed fatigue in reading, with letter dancing and dyslexia. Examination showed that with her central field she could read letters and words written in different colors. Twenty days before her death the patient's symptoms were much the same as above summarized, with the exception of a further enfeeblement of luminous perception. Eight days before her death she fell, and at this time developed a complete left hemiplegia, entire cutaneous irresponse, violent vomiting and clonic and tonic convulsions of the face and right side. The necropsy showed recent large hemorrhage in the right hemisphere destroying the centrum ovale and the basal ganglia, and filling the right lateral ventricle. A fresh hemorrhage the size of a bean was situated at about the junction of the anterior and middle third of the left callosum. A second lesion was found between the floor of the posterior horn of the left lateral ventricle and the basal surface of the occipital lobe. Close examination showed a large thrombosed vessel, and that the parts destroyed were the white substance of the third occipital convolution, more or less completely the white substance of the occipital extremities of the lingual and fusiform convolutions, and the posterior inferior point of the cuneus (Fig. 8).

According to Verrey, up to the time of the publication of his paper, eight cases of hemiachromatopsia had been reported. Some of these were associated with verbal blindness, alexia, dyslexia, or other visual disturbances of language, but in some the hemiachromatopsia was not thus accompanied, and Verrey therefore concludes that hemiachromatopsia of cerebral origin, having its seat in the left hemisphere, may exist without being accompanied by verbal blindness. The same has been proved by others to be true of hemianopsia. The cases both of Brill and of Verrey prove that a center for color recognition, and for the chromatic sense is on the

Fig. 8.



Mesal aspect of the left hemicerebrum showing the cortical extent of a lesion causing hemiachromatopsia, in a case recorded by Verrey; the subcortical radiations of the lesion are described in the text. A small lesion of the callosum is also shown.

mesotentorial surface of the hemicerebrum, probably in the fusiform and lingual convolutions. Not improbably also in part the sense is located in the adjoining portion of the cuneus. In Brill's case it would seem from the report that the condition was not a hemiachromatopsia, but one of bilateral partial color blindness, although unfortunately the writer is not sufficiently explicit with regard to this point.

The chromatic half retinal representation would be most likely to be situated on the mesotentorial surface of the hemisphere. Verrey makes the valuable suggestion, which was partially demonstrated by the study of his case, that somewhat higher on the mesal surface of the occipital lobe than the area for the chromatic sense, is located in successive order the representation of form and of luminosity.

It is highly probable that just as we have a lower or primary visual cortical area in the cuneus and first occipital gyre, and a more highly evolved area in the angular region, the former representing retinal half fields and the latter the

central or macular region, so color recognition has two distinct cortical areas of centers of representation, one mesotentorial for the chromatic half fields and the other lateral occipital in the neighborhood of the angular gyre for color recognition by the macula.[16]

The cerebral representation of the musical sense, or of what some prefer to call intonation, or even note hearing, is one which has engaged the attention of a few of the best known workers in the field of localization, as well as of others who have turned to the subject because of its esthetic side. For reasons which will presently appear, intonation has an area of cortical representation entirely separated from that for word hearing, although doubtless not far removed from the latter. In the diagrammatic scheme (Fig. 1) it has been placed in the cephalic extremities of the first and second temporal gyres where its location is indicated by anatomical, morphological and clinicopathological investigations.[17] I shall confine myself to a presentation of a few of the most important facts indicating the separate localization of this so-called musical sense.

The localization of a musical center or, speaking more correctly, of a center for the appreciation of the relation of tones, early engaged the attention of Gall and his school. Gall indeed devoted much time and work to the establishment of this localization, the result being that he placed this center over the Sylvian fissure, in the upper and lateral part of the forehead, in the temporal region almost bordering on the supraorbital ridge. As the parts of the brain corresponding to this cranial localization would be in large part the anterior extremity of the temporal lobe, Gall's localization in this case, as in that of speech and of higher reasoning faculties, was probably nearly correct. Others have located the intonation area elsewhere, Flechsig, for instance, in the subparietal region.

A few facts well known to students of cerebral disease, and especially of aphasia, clearly indicate the differentiation of word hearing and the musical sense. Aphasic patients, the aphasia in some cases being almost total, may retain the musical faculty. A number of such cases have been recorded. A few cases with note deafness without word deafness have also been recorded, one by Grant Allen,[18] for instance, the case being that of a young man who was entirely unable to recognize musical notes, and yet had no affection of hearing or speech.

Occasionally the musical defect, evidently due to localized cerebral disease, has reference only to high tones.

In somewhat numerous cases word deafness and note deafness or musical deafness have been associated in the same case, and in a few of these one of the defects has been recovered from while the other remained. In a case recently under the observation of the writer, a man, forty-four years old, after an apoplectic attack, became word deaf, word blind, and paraphasic. During the first four or five weeks after the cerebral seizure causing his aphasia, from the statements of both his wife and daughter, the patient seemed to have entirely lost the power of appreciating tones of music. Although his aphasia was still of a most serious character when seen by me, a little more than three months after his attack, he had largely regained his power of appreciating music. On testing him by having his daughter play on a piano, he was able to hum tunes which had been well known to him, in unison with the instrument, although he could not recall the words of the songs, or even their names. A case like this indicates that while the center for tones is separate from that for words, the two are in the same general region of the cortex, and a destructive lesion involving one probably implicates the other by pressure or temporarily by edema.

As bearing upon the subject of music or tone representation in the cortex, the well-known fact may be recalled here that a considerable number of cases of mental enfeeblement, or even of acknowledged idiocy are able to repeat tunes or appreciate music, although deprived of the faculty of speech. In comparatively rare cases the insane retain the musical faculty after the mind is largely disintegrated and the speech faculty has for the most part disappeared.

One of Spitzka's conclusions regarding the brain of Major Powell is interesting in this connection. "The rather superior, but not extraordinary, development of the area in closest proximity to the auditory field," says this writer, "can safely be correlated with his good appreciation of music, not only of European composition but of Indian as well, as shown in his masterly analysis of Indian songs and melodies. As Dr. McGee has stated, Major Powell was a 'potential musician,' if not a trained one, and this statement is supported collaterally by the fact that his daughter and other blood relations are highly accomplished musicians.[19]

In the few well observed and well recorded cases of amusia in which necropsies have been obtained, the lesions have involved the anterior portion of the temporal lobe, usually the first or the first and second temporal gyres, although sometimes in addition some of the cortical matter hidden within the Sylvian fossa.

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2 Univ. of Penna. Medical Bulletin, V. 17, May, 1904.
3 The Disorders of Speech, Edinb., 1894.
4 Deutsche Zeitschrift f. Chirurgie, V. 60, p. 417, 1900.
5 Allgemeine Zeitschrift f. Psychiatrie, Berlin, V. 59, p. 952, 1902.
6 Allgemeine Zeilschrift f. Psychiatrie, Berlin, V. 61, p. 424, 1904.
7 Compt. Rend. Soc. de Biol., December, 1891.
8 At the recent meeting of the American Ophthalmological Society, held in Atlantic City, July 13 and 14, 1904, Dr. W. A. Holden, of New York, presented a report of a most interesting "Case of Mind Blindness, Unique in That the Entire Mesial Surface of Both Occipital Lobes and Both Optic Radiations Were Preserved." Through the courtesy of Dr. Holden I am able to make brief reference to this case, which will be published in the Transactions of the Ophthalmological Society. This patient, after two apoplectic seizures—the first eight years and the second seventeen months before his death—became emotional, depressed, mentally confused, aphasic, hemiparetic and mind blind. He also developed delusions of marital infidelity, visual hallucinations, and failed in memory, gradually growing weaker physically and mentally until his death. Necrosy showed

that the parietotemporal branch of the medicerebral artery in the Sylvian fossa was occluded on each side. This occlusion caused on the left necrotic softening of the posterior part of the left temporal lobe of the lower and posterior part of the supramarginal (subparietal) gyre, of the whole of the angular gyre and its adjacent parietal borders. A sunken, older-looking lesion was present near the occipital tip. On the right the softening involved the whole of the supramarginal (subparietal) gyre, the upper portions of the angular and postparietal gyres, the lesion reaching back into the occipital lobe just behind the parieto-occipital fissure, nearly to the mesal edge of the hemisphere. The upper half of the postcentral convolution was also damaged. It will be seen that the report of this case, taken in conjunction with Liepmann's case, and other cases, confirms the writer's view of the large parietotempero-occipital area concerned with object seeing in its different forms.

9 Dr. Spitzka's paper was read in part before the Anthropological Society of Washington, and was published in full in the American Anthropologist (N. S., V. 5, No. 4, October-December, 1903). The writer is indebted both to Dr. Spitzka and to the editors and publishers of the Anthropologist for the privilege of using the illustrations, figures 2, 3, 4.

10 Journal of Nervous and Mental Disease, 1896, p. 706.

11 The brain of the Papuan was drawn by Dr. Spitzka from a specimen in the Anatomical Museum, Columbia University, and is used by his permission, as is also the brain of Helmholtz (after Hansemann), shown in Fig. 4. These illustrations, like that of the brain of Major Powell, are taken from Dr. Spitzka's paper, already referred to, in the American Anthropologist.

12 On May 3, 1891, Professor Mark W. Harrington read a memorial address on Professor Winchell before the University of Michigan. This address has been published in pamphlet form, and from it a good idea of the habits, acquirements and mental characteristics of Professor Winchell can be obtained.

13 American Journal of Neurology and Psychiatry, V. 1, N. Y., 1882. Previous to the report of the necropsy, Brill had reported this case clinically in the Chicago Medical Review, April 1882.

14 Untersuchungen über die Localisation der Functionen in der Grosshirnrinde des Menschen, Wien, 1881.

15 Verrey, Arch. d'Ophthal., Par., V. 8, July and August, 1888.

16 For a fuller discussion of this subject in its different bearings the monographs and works of Verrey, Munk, Wilbrand, Swanzy and Norris and Oliver should be consulted. Mackay, at the annual meeting of the Section of Ophthalmology of the British Medical Association, held at Glasgow, August, 1888, presented an interesting contribution specially discussing acquired color blindness and the question of the separate recognition of color, form and light, giving a table of cases up to that date (British Medical Journal, Nov. 10, 1888).

17 In the recent series of papers on cerebral localization by the writer, of which this is one, this subject might have been appropriately considered with that of aphasia and the cerebral zone of speech (American Journal of the Medical Sciences, September, 1904), but for reasons of convenience it is discussed here. It is not, however, out of place in this connection, as the area for the musical sense, like that for other forms of symbolization, may in part at least be considered as belonging to the great concrete sphere of the cortex.

18 Mind, April, 1878.

19 Spitzka, Amer. Anthropologist, N. S., V. 5, October-December, 1903.

REPORT OF A CASE OF SPLENOMEDULLARY LEUCEMIA TREATED FOR NINE MONTHS BY THE X-RAY.[1]

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W. A., whose case is here reported, first came to my office August 4, 1903. His age at that date was twenty-seven years. He is a native of California, has always resided in this state, the past eight years in San Francisco. His family history is excellent, for his father, mother, two brothers and two sisters are all living and well, and no brothers or sisters have died. He was always well previous to his present trouble, except for several attacks of tonsillitis—he recalls three or four such attacks in all. He never had malaria. He came to San Francisco in 1896 to work as a bookkeeper, and continued at that occupation until compelled by his present illness to give it up. The history of this present illness naturally divides itself into two periods and will be so described for the sake of contrast. The first period is that from the time the symptoms were first observed until X-ray treatment was begun; the second period covers the last nine months, during which X-ray treatment has been given.

First Period—April, 1902, to October, 1903.—In April, 1902, the patient first noticed that he was pale, weak and short of breath on walking. He then consulted Dr. J. H. Graves, of this city, who found the spleen enlarged, the blood count and smears characteristic of splenomedullary leucemia, and gave Fowler's solution for a month without effecting any material improvement. The patient was then persuaded by friends to consult a homeopath in this city in June, 1902, who never examined his blood at all, but diagnosed malaria, and treated him for eight weeks for that disease. Growing no better, the patient then gave up his work and returned to his parents' home in Monterey County on September 1, 1902. In September, beginning about the tenth, he had an attack characterized by severe pain in his left side, which kept him in bed for ten days—the first and only pain he has ever had during his illness. He remained at home until December 1, 1902, then returned to San Francisco and went to work again for his old firm, but traveling about "drumming" trade instead of keeping books in the office. This work he continued for three months; but all the while he felt very weak and tired, and his abdomen was steadily enlarging.

The latter part of February, 1903, he once more gave up his work and went to Byron Springs in search of health. There his blood was again examined by Dr. Robert Crees, who once more found the condition to be a splenomedullary leucemia. Remaining in Byron Springs only one week, the patient returned to San Francisco, and to Dr. Graves, who had first diagnosed his case; but after only a brief stay here he went on to his home in the country. There he remained until the following August, taking quinine, arsenic, and iron at intervals for four months; but continuing weak, pale, unable to work, and with abdomen constantly enlarging. On June 30 and July 1, 1903, he had a severe attack of epistaxis, and lost considerable blood, but there was no other unusual incident in his history during the months he remained at home.

When first he came to me, on August 4, 1903, he was very pale, dyspneic and weak. His abdomen was greatly distended, tense, and caused much discomfort; and in addition to the splenic tumor it contained a small amount of ascitic fluid. His digestion was much disturbed and sleep interfered with by the intra-abdominal pressure. There was no pain or tenderness over the long bones. No organic disease could be made out in the lungs or heart, and the urine was normal. Nowhere were there found enlarged lymphatic glands. The liver was not enlarged. The spleen on August 6 reached 12 cm. below the level of the umbilicus, 5 cm. to the right of the median

[1] Read before the California Academy of Medicine, June 28, 1904.

line, and its total vertical area of dulness measured 39 cm. Of the first blood examination, made by Dr. Graves in April, 1902, I have not been able to obtain any report. Of the examination made on February 27, 1903, Dr. Crees gave the following report: Reds, 2,560,000; whites, 495,000; hemoglobin 60 per cent. No differential count was made at that date, but Dr. Cree's report states that myelocytes were seen in large numbers and nucleated reds were found. A later count, made by Dr. Crees on March 5, showed 371,000 white corpuscles. A differential count made by Dr. Graves on March 10, 1903, showed the following: Myelocytes 43 per cent; polymorphonuclears 37 per cent.; large lymphocytes 8 per cent; small lymphocytes 7 per cent; eosinophiles 5 per cent; and occasional nucleated reds were noted.

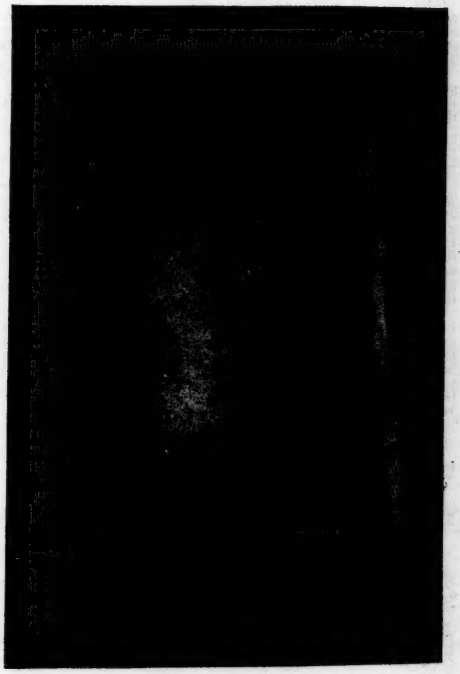
On his second visit to my office, on August 6, the white count was 220,000, but at that date no differential count was made. He was then put upon routine treatment: Fowler's solution in ascending doses, which were well tolerated; but during the month of August, while on this treatment, his condition grew rather worse. On September 2, after one month of arsenic, his blood examination gave the following: Whites, 141,000; reds, 1,620,000; hemoglobin 37 per cent.; myelocytes 45 per cent.; polymorphonuclears 25 per cent.; large lymphocytes 15 per cent.; small lymphocytes 7 per cent.; eosinophiles 8 per cent.; nucleated reds, 40, while counting 295 whites. Because his condition was at least no better and because no definite promise of improvement could be made him, the patient concluded to return to his home in the country, and did so early in September.

Thus, at the end of the first period of the illness, in spite of the employment of all the ordinary and well tried methods of treatment for this ailment, by several different physicians, this man's condition was distinctly worse than at the outset, and the outlook was for a fatal termination of his illness within a few months at most. He was practically sent home to die.

During the month of September, however, my attention was attracted to the article by Senn, published in the *Medical Record* of August 22, 1903, describing a case of splenomedullary leucemia treated by the X-ray with apparently great improvement. This plan of treatment had at least the virtue of novelty and seemed worthy of trial. I therefore wrote to the patient, advising him to return to San Francisco and make the experiment, at the same time explaining the uncertainty that any good would result. He decided to try the X-ray as advised, and returned to San Francisco September 29 for that purpose.

Second Period—October 1, 1903, to July 1, 1904. Condition at Outset of Treatment.—Before treatment with the X-ray was begun, certain data were collected as a basis for determining results: (1) *General condition:* It was recognized that a change in the feelings of the patient must be looked upon as unreliable evidence of improvement, unless accompanied by other more tangible proof; and yet his discomforts were so obvious that any disappearance of them could be noted by the observer, as well as by the patient himself. The marked symptoms of illness were the pallor, weakness, shortness of breath and abdominal distention; about the presence and degree of these there could be no question. They had been present for a year and a half, gradually grown more pronounced, and had kept the patient from doing any work for the previous six months. No treatment employed had ever done more than temporarily mitigate these symptoms, and nothing had ever removed them, even temporarily. (2) *Condition of the Abdomen:* The abdomen, on account of the greatly enlarged spleen, was exceedingly tense. The spleen was quite immovable on change of the patient's position. There was a moderate amount of ascites present. The outline of the spleen, as determined by palpation and percussion, was marked out on the surface of the body, and a photograph taken on September 30, 1903, which is herewith presented. The measurements, as set down on September 30, were as follows: Circumference of the abdomen at the navel, 95 cm.; tumor extends 12 cm. below level of navel, 5 cm. to right of median line below level of navel, but not to right

Fig. 1.



Photograph of patient, W. A., taken September 30, 1903; showing outline of splenic tumor.

above level of navel; total vertical dimension of dulness 39 cm. Patient's weight at this date 175 pounds. (3) *Condition of the Blood:* This examination was made for me by Dr. H. R. Oliver, instructor in pathology in Cooper Medical College. It showed on October 1 the following count: Red corpuscles, 2,508,000; white corpuscles, 126,000; hemoglobin, 47 per cent.

With these data obtained, X-ray treatment was begun on October 1, 1903. Arsenic and all other drugs were then discontinued, and none have been given since the X-ray was begun. The applications were all made for me at Lane Hospital by the internes there—Dr. George Coleman, Dr. Charles Coleman and Dr. Garth Parker.

Mode of Application.—Throughout the course of treatment the static machine and the street current were used, one about as often as the other; and a "soft" or low vacuum tube made by Queen. The duration of treatment was usually twelve to fifteen minutes. The tube was almost invariably held at a distance of ten inches from the body, but in a few instances as close as eight inches. The site of exposure was the splenic tumor as a rule, either directly in front or on the left side. Whenever there was any skin reaction, even the slightest, the splenic area was let alone for the time being and the applications made over the long bones—thighs and legs especially and the sternum less frequently. At first the exposures were made once each day; but it was soon found that the skin would not tolerate this frequency, and therefore the plan was adopted of giving them every other day. Once or twice treatment had to be interrupted altogether for a week or more because of dermatitis. During the nine months, October 1, 1903, to date, the patient received in all 144 applications.

Effects of Treatment.—Reviewing these in the same order as the data considered at the outset, I will speak of (1) the *Effects on the General Condition:* This promptly showed improvement. At the end of the first week of daily treatment, the patient reported that he felt much better, did not tire so easily, could walk further, and could eat without abdominal distress. From October 11 to November 7 treatment had to be interrupted part of the time because the X-ray apparatus was out of order, but mainly because of an extensive burn at the site of application. But it was resumed November 7, and though treatments were never daily thereafter, the patient by the end of November reported that he felt perfectly well; he had lost his pallor, looked well, had gained ten pounds in weight, and felt none of his old symptoms of weakness, dyspnea, and abdominal distress. From that date on to the present time his invariable report has been that he feels perfectly well and would not know anything was the matter with him except for his enlarged abdomen and his blood counts. He went back to his old occupation on December 1, 1903, and has worked every day continuously since that date. It is absolutely certain that his health is better now and has been better since November, 1903, than it had ever been at any time during the previous year and a half he was under treatment, before beginning with the X-ray; and it may be asserted with equal positiveness that from a symptomatic standpoint the man is cured.

But the other manifestations of disease have not kept pace with the symptoms. As regards (2) *the Effects on the Condition of the Abdomen,* improvement has certainly occurred, but restoration to the normal has by no means been accomplished. Change here has been very slow, and is even yet more subjective than objective. The first effect noted was the disappearance of free fluid from the abdomen, which was no longer demonstrable after the end of November. Gradually also the spleen has become more freely movable within the abdomen; and the tension has undoubtedly decreased, so that the wall has become less resistant to palpation. But the measurements, made regularly once a month, have shown very little change from those found

Fig. 2.

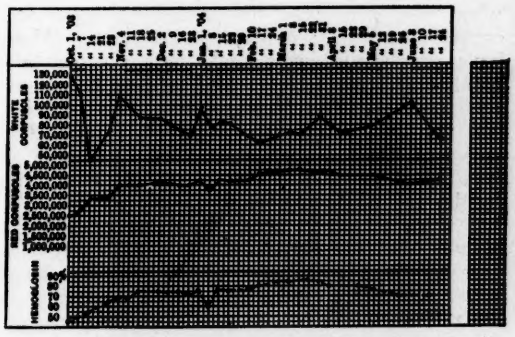


Chart showing condition of the blood during the nine months patient was treated by X-ray; the straight black line at the top indicates continuous treatment, while the breaks indicate interruption of treatment.

at the outset of treatment. The circumference at the navel has never been less than 94 cm.; the distance of the tumor's extent to the right of the median line has never been less than 3½ cm.; and the distance below the navel never less than 7 cm.—this latter dimension being the only one that has shown any decided decrease. At the present writing it must be admitted that, while the patient's general appearance and nutrition is improved, the contour of his splenic tumor has not materially changed. (3) *Effect on the Condition of the Blood.*—For my knowledge of this I wish to thank Dr. Oliver, who has made regular examinations all during the time of treatment. His findings are given in the accompanying blood chart. The effects of treatment on the blood will be best considered by taking up the various elements separately. *A. The White Count.*—Here the least effect has been produced. The chart

shows that while at the outset the white corpuscles numbered 126,000 and have once fallen as low as 45,000, they have never approached more nearly than that to the normal, and most of the time have fluctuated in number between 70,000 and 90,000. There is apparently a definite relation between the frequency of the X-ray applications and the decrease in the white corpuscles. During the initial period of treatment, when it was given every day the whites rapidly tumbled from 126,000 to 45,000 in two weeks. Then as treatment had to be discontinued because of dermatitis, the whites steadily rose again to 110,000. When treatment was resumed they once more gradually fell to 70,000. Similar fluctuations have so repeatedly been observed, apparently dependent upon the regularity or irregularity of treatment that it would seem to be more than chance that has determined their occurrence. *B. The Red Count.*—Here there has been noted a remarkable improvement since X-ray treatment was begun. The red corpuscles promptly rose during the first two weeks from 2,608,000 to 3,250,000. Then, while treatment was suspended, they remained stationary about that point, but when treatment was resumed they again increased until they numbered 4,000,000. They have practically never since fallen below this point, and have been as high at one period as 4,750,000. *C. The Hemoglobin.*—This likewise has markedly improved, following closely the curve of the red corpuscles. On October 1 it was but 47 per cent. Then it steadily rose until by the end of November it was 75 per cent. It has since remained about this line or slightly above. *D. The Myelocytes.*—These have decreased since treatment was begun, but have never disappeared from the blood. On October 1, 1903, they numbered 48 per cent; on June 25, 1904, when the last count was made, they numbered 27 per cent., and this is the lowest percentage found at any time since the patient has been under observation. *E. The Nucleated Red Corpuscles.*—These quickly disappeared after the X-ray treatment was begun. On October 1, 20 were counted, on November 4 only four, and after that never more than one was seen—all the differential counts being on the basis of 400 white cells counted. In the past three months no nucleated reds at all have been seen.

Bad Effects of Treatment.—None such were at any time observed, except the dermatitis. No such evidences of constitutional disturbance, as Senn mentions in his report, were seen during the progress of treatment of this case; and "high temperature and other evidences of intoxication," such as he describes, never occurred during the months that the X-ray was used.

In conclusion, I desire to say that this case is reported simply as a presentation of facts, not to uphold any theory. Only as more such reports are made by different observers, can we arrive at any just estimate of the value of X-ray treatment in leucemia.

A COMPLETE CASE OF SYRINGOMYELIA.

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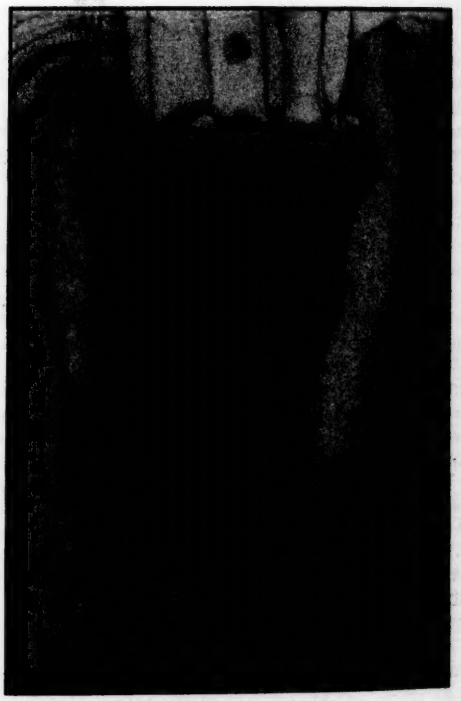
SYRINGOMYELIA is not a very rare disease, though outspoken cases of it always have a more than passing interest. In most cases, however, there is a lack of indication as to the beginning of the pathological process which causes the characteristic symptom. It is generally conceded now that the basis of the degenerative process in the spinal cord is either a congenital malformation of the cord or some destructive lesions consequent upon injury, or some pathological process in early life many years before the characteristic atrophy and sensory symptoms of the fully developed disease. The case that we are about to describe has in its history evidence of the preliminary pathological condition which led to the formation of a cavity or tumor in the cord later in life.

Fig. 1.



Atrophy and dissociation of sensation in area outlined.

The patient was a young woman of about twenty-one years of age, who came to the Out-

door Department of the Presbyterian Hospital presenting well-marked symptoms of syringomyelia in her left hand. With the exception of this condition she is now perfectly healthy, but she recalls distinctly that some fourteen years ago she suffered from an attack of weakness and paralysis in this same arm. She does not remember exactly all the details, but thinks that this came on rather suddenly and at a time when she was perfectly well just before. On close questioning, however, she confesses that she had about the same time what she calls a "rising on her face." This, manifestly, from her description, was a large boil. The possibility of its having something to do with the condition which developed is not impossible, but as we shall see a little later, a direct connection does not seem at all likely.

She remembers that this weakness of her arm came on suddenly, and that she was unable to use her hand at all and especially for such finer movements as picking up pins and the like. Her fingers seem to have been especially affected. The paralysis that occurred, however, involved the whole arm as far as the shoulder, for she could not use the arm at all. Previous to this illness she cannot remember having suffered from any other serious affection, and she does not even seem to have had the ordinary diseases of childhood.

Her arm gradually regained its strength and at the end of three or four months she could use it as well as ever. Before the end of six months no trace at all was left of the paralysis.

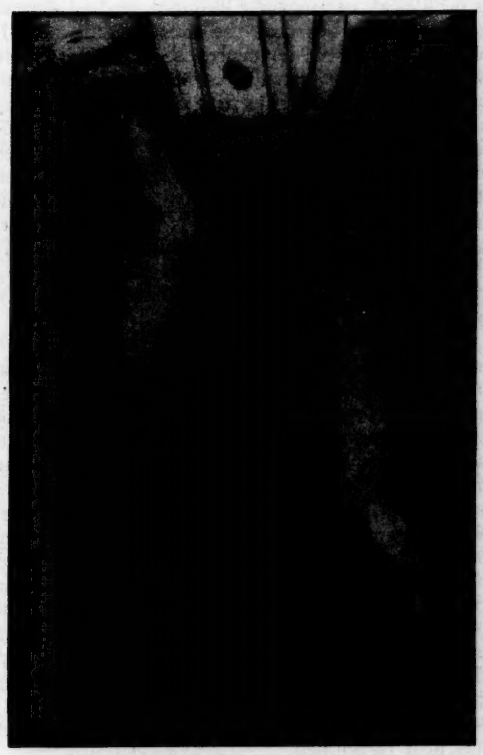
Just ten years later, that is about four years ago, when she was seventeen years of age, she began to notice that her hand trembled considerably after doing any work. She found it practically impossible to hold the fingers still at times. Increasing weakness became manifest and she found it difficult to do many things that she had been familiar with for years and had gradually to learn the use of her left hand to replace her right. Her hand was inclined to be cold and during cold weather was tremulous and very weak. During the winter time it was often so numb that she could not use it at all.

Three years ago she noticed a wasting of the muscles of the hand, especially those of the ulnar side of the hypothenar eminence becoming flattened. This wasting of muscles spread with gradual diminution of the size of the thenar eminence and with distinct wasting of the interossei muscles. Her fingers began to be overextended in the proximal phalanges, though with flexion of the distal phalanges giving a characteristic appearance of beginning claw hand.

The present condition as regards the muscles shows the flat hand of atrophy of the hypothenar and thenar eminences, both having disappeared, and the distinct beginning of main en griffe. In the affected area which extends somewhat above the elbow there is some temperature sense disturbance, but this is comparatively slight. The pain sense, however, is seriously disturbed, and over an area some eight inches long on the ulnar side of the forearm there is complete analgesia. In this same area she feels touches very well and recognizes heat better than cold. This dissociation of sensation points, of course, to disturbance of the sensory tract immediately surrounding the central canal in the lower cervical region and makes it evident that the diagnosis of peripheral symptoms of syringomyelia.

The interesting problem in this case is the etiology of the condition. It has generally been

Fig. 2.



Atrophy and dissociation of sensation in area outlined.

conceded that syringomyelia develops either on a basis of some congenital malformation of the cord or on a hematomyelia, either spontaneous or traumatic. Even where the predisposing element in the case is a congenital lesion it is usually considered that a hemorrhage taking place into the cord constitutes the first step in the further progress of the case that eventually leads to the appearance of the characteristic peripheral symptoms of syringomyelia.

The occurrence of the first paralysis of the arm for fourteen years before the present condition and over ten years before the first symptom of syringomyelia was noticed, seems to make it

clear that we are not in the presence of a congenital malformation as the basis of the condition which has developed. The complete recovery from the first attack and the long interval of absence of symptoms would seem to preclude the impossibility of there having been a serious defect in the cord which predisposed it to a hemorrhage or to some other pathological lesion at the time of the first set of symptoms.

The symptoms that developed on that first occasion point to the occurrence of a hemorrhage or thrombosis or embolism. To consider them in their reverse order, embolism seems unlikely because the source of it would usually be found in some affection of the endocardium and there is no history of anything like that, and an examination of the heart at the present time reveals no signs of an old endocarditis. With regard to thrombosis, the question is less easily disposed of. At the time that her first set of symptoms developed she was suffering from anemia. She has, indeed, during the most of her life, been rather poor in blood. It is well known how often it happens in anemic cases that a sort of spontaneous thrombosis occurs. If the blood vessel to a portion of the cord were shut up in this way the result would be a necrosis of surrounding tissue quite as effectually as if there were a hemorrhage.

It has come to be usually considered, however, in these cases, that a hemorrhage is the most likely preliminary lesion on which the subsequent developments take place. This may be either spontaneous or traumatic. Spontaneous hemorrhages are quite possible and have been noted in a number of cases. Often there is a suspicion of trauma, but this cannot be determined, owing to the defective history. If a hemorrhage be supposed to have occurred in this case, there came as a result an overgrowth of connective tissue which contracted into a scar. The irritation set up by this led to the development of gliosis of the cord, affecting mainly that portion of the cervical cord lying around the spinal canal on the left side. This would afford a very satisfactory explanation of the condition which has now developed.

With regard to the possibility of an infection from the boil on her face, it seems to have existed at the time of the primary paralysis—it may be said that if there were an infectious embolus at that time in the cervical portion of the cord, it would surely have caused secondary infection in the neighboring area, and this would have produced a more lasting and more extensive set of symptoms than was observed.

There is one important point in the treatment of these cases. Owing to the dissociation of sensibility they are likely to suffer from various lesions, especially from burns and at times from rather severe trauma in the affected part. Owing to the lowered condition of the trophic nerve supply to the part these injuries heal very slowly and are rather obstinate to all ordinary treatment. It is important then to warn patients suffering from beginning syringomyelia of the necessity of taking the greatest possible care of the affected member, in order to avoid the accidents to which it is liable, because of the disturbed sensory condition of the part. Beyond this there is not very much to be done and of course the outlook is absolutely unfavorable, since there is no hope of any decided improvement, to say nothing of cure.

THE CONVEYANCE OF YELLOW FEVER.[1]

BY HENRY R. CARTER, M.D.,
OF BALTIMORE, MD.

I WILL say nothing of the history of my subject. It is interesting to read the many theories advanced for the causation and prolongation of yellow fever; especially the arguments for its conveyance by "infected air," and its "spontaneous origin" under specified conditions. Nor is such a review altogether unprofitable, but the interest is speculative now rather than practical, and it would take time. I cannot even take the time to give the history of the evolution of the doctrine I shall advocate, although I should like to show you how blind we were to Dr. Finlay's arguments until Reed's demonstration compelled us to see.

I simply propose to announce what I think to be *the true doctrine* of the propagation of yellow fever, and to give briefly my reasons for the faith that is in me.

This is the proposition—the "creed," so to speak, of the doctrine: *Yellow fever is conveyed from the sick to the well by a mosquito host, the Stegomyia fasciata, contaminated by feeding on the sick man; and, in nature, it is only thus conveyed.*

It does not seem necessary to discuss the first part of this proposition, as I am sure you all accept the statement that yellow fever *is* thus conveyable. It is a positive proposition and thus admits of positive evidence, and that evidence is satisfactory and abundant. The American Commission, of which Reed was chairman, reported, first and last, 12 cases thus conveyed; Reed and Carroll, two; Guiteras, eight cases; Parker, Porthier, and Beyer, at Vera Cruz, one case. The second party at Vera Cruz, one case; the Pasteur Institute Commission at Petropolis, four cases; Ribas and his confrères at Rio Janeiro also reported successful experiments, but I have not seen their report and do not know the number of their cases. Indeed, all who have tried to convey yellow fever in this manner have succeeded. I do not think, then, that any of us doubt that yellow fever is thus conveyable.

Note, please, the conditions under which this conveyance occurred in the experiments noted: (1) A particular kind of mosquito was used—*Stegomyia fasciata.* (2) It bit a patient in the

[1] Read before the Texas State Medical Association, April 27, 1904.

first three days of yellow fever. (3) It was kept a considerable time—twelve days was the shortest time—and then bit the well man.

After once acquiring the power of conveying yellow fever, for which a certain time after biting the sick man is necessary, the mosquito seems to retain the power indefinitely; at least one of Reed's mosquitoes conveyed yellow fever fifty-nine days after feeding on a yellow fever patient.

Given the above conditions, yellow fever was produced with reasonable constancy. A few men, very few, were found to be immune to this method of conveyance, and not every mosquito bite conveyed yellow fever even to those who subsequently succumbed to mosquito bites.

Let us inquire into these conditions one by one and see if we can tell what are the essentials of this method of propagation of yellow fever.

1. The kind of mosquito. So far, except one trial of *Culex pungens,* only the *Stegomyia* has been used for experiment. It seems idle then to speculate if some other genus or species of mosquito will not also act as host. Analogy would lead us to suspect that some other species of *Stegomyia* would do so, but that no mosquito not of this genus would. The genus, and this species of it, is widely distributed in hot countries. Obviously we cannot exclude such species as are found in places where yellow fever does not spread when introduced. And here let us notice that if yellow fever is conveyed by only one genus or species of mosquito, then it is conveyable only where and when that particular mosquito is found, and is active, and that arguments concerning its conveyance drawn from the habits of *other* mosquitoes are valueless, unless these habits are common to the *Stegomyia* also; and the habits of the *Stegomyia* are in many respects different from those of other mosquitoes.

Nor does the presence of mosquitoes in a place in any wise imply that yellow fever can be propagated there, unless they are *Stegomyiæ.* I would not state facts so obvious unless I had seen the need of it. I was asked, "How can you say that a vessel a few hundred yards off shore is safe from the invasion of infected mosquitoes, when you yourself say that you have seen swarms of mosquitoes come aboard a mile out at sea?" Now the "infected mosquitoes" *Stegomyiæ,* and the "salt-water" mosquito, a *Culex,* that boarded me off shore were a different thing altogether.

A gentleman, an excellent physician, too, asked why, if mosquitoes conveyed yellow fever, could one explain that a certain hospital where yellow fever was treated remained uninfected, "although being close to the marsh it was swarming with mosquitoes." There was no evidence to show that these were *Stegomyiæ.* Indeed this variety is not, as a general thing, found in marshes.

2. In all the experiments the patient was bitten in the first three days of yellow fever. Is this the limit of time during which he can infect the mosquito? You can see what a very important point it is to determine this; because if it be true, a patient after this time can no longer communicate the disease even if bitten by a mosquito. The only experiments on this matter are those of the Pasteur Institute Commission. They injected blood from three cases of yellow fever, each one in the fourth day of the disease, into three subjects, it having been found that the disease was conveyed quite certainly by this method. None of these subjects developed yellow fever. One of them was shown to be susceptible to yellow fever by being bitten afterward by an infected mosquito. This commission concludes from this that the power of the patient to produce infection lasts only three days. Yet this seems to me too absolute a conclusion for the number of observations made. Unquestionably the blood of *these* patients did not convey yellow fever, but I would prefer to see more experiments on this matter before I regard it as settled; and it is a very important one for the sanitarian. Important, because we wish to isolate the patient *only* while infective, and if three days is the limit, we will not isolate him longer. Not only for his sake, but for our own. My experience has been, and I think all health officers will confirm me, that restrictive measures of sanitation, especially if domiciliary measures are used as well, are hard enough to carry out any way, and that the less we require, provided it be all that is necessary, the better will the work be done. The enforcement of unnecessary measures of that kind is generally at the expense of some essential. As of old, the tithing of mint, anise and cumin leads to the neglect of the weightier matters of the law.

3. How long must the mosquito wait after biting the yellow fever patient before it can communicate yellow fever? How long does it take for the infected mosquito to become infective?

Now, before Reed's work in Cuba, I had determined the existence of a period of time—and a considerable period of time that must elapse after the development of a case of yellow fever in an uninfected place before that place became infective. During this time yellow fever could not be contracted in this place. This period, the length of which I could only approximately determine, I had called the "extrinsic incubation" of yellow fever. I did not know the explanation, yet the knowledge of *the fact* was of great service to me in epidemic work. It was, of course, the time that it takes for the mosquito after biting the sick man to become infective. This time depends on the temperature—as do all of the processes of, and in, the mosquito—being longer in low temperature. The shortest time in which this power of conveying infection has been manifested in the experimental cases, was twelve days. It was usually decidedly longer than this in Reed's experiments, most of

which were in the winter. The twelve day case was in August. It seems to be accepted that twelve days is the shortest time in which an infected mosquito can come to be infective, and this agrees with my own crude determination of the minimum period of extrinsic incubation—"somewhat over ten days" and yet I cannot think that this has been *experimentally proven.* Not enough attempts have been made during hot weather with mosquitoes for less than twelve days. The determination of the minimum of this period is of interst, but not of great importance.

I am sorry to confess that we have not found the micro-organism of yellow fever, although it has been assiduously searched for both in human blood known to contain it, and in the mosquito; yet some direct observations have been made on it. In the blood, at least, it exists in an ultramicroscopical form, as was first shown by Carroll working on lines laid out by Reed and himself. He found that blood serum filtered through a Berkenfeld filter, would still produce the disease. This was confirmed by the Pasteur Institute Commission and, in my opinion by the working party at Vera Cruz, the Pasteur Institute Commission found that serum passed through a Chamberlain bougie B would convey infection, while that passed through a bougie F would not, thus determining within the limits the size of the smallest of the infective germs. I say, "the smallest infection germs" advisedly, because they *may* exist in the blood in different forms—as the *Plasmodium malariæ* often does—and only the small ones pass the bougie B.

It is worthy of note that the direct injections of blood and serum, filtered and otherwise, seem to differ from mosquito inoculations in the length of the period of inoculation. Of 24 mosquito inoculations in normal individuals, of which the period of inoculation was accurately recorded, the shortest was two hours less than three days, and the longest two hours over six days, and all save these two were between three and six days. With this agrees my own observation of the period of incubation of 12 cases of yellow fever, naturally contracted, each with a single, short exposure—all of which gave incubations of from three to six days. Now in the 14 cases of blood and serum injections, the time varied from one day and twenty hours to twelve days and eighteen hours, three of the cases being eight days and five hours, 9½ days, and 12¾ days. Whether there is a real difference, or whether these mosquito inoculations and my observations *happened* to have no very long or very short periods of incubation, I cannot say. Only as we have 36 of these cases recorded, and this is the natural way of conveying the fever, I would rather base my sanitary measures on the data from them than on the results of direct injection of blood.

The organism is very easily killed; blood heated to 55° C. for five minutes is no longer infective, and it soon dies in blood exposed to the air, although blood five days old covered by oil of vaseline is still infective.

So much for this positive part of our proposition, that yellow fever *can* be conveyed in the manner stated.

The second part of it is different in its very nature. It is a *negative* proposition. To say that "yellow fever is only conveyed by a mosquito host," is saying that it is not conveyed in any other way—in any one of the many other ways which might be claimed as the true one—and, to proceed logically, one should examine the evidence advanced for every such way of conveyance and demonstrate its futility. There are two reasons why I do not do this: (1) because it would be almost unending, and (2) because, as I do not believe that it is conveyed in any other way, I might not state the arguments for the affirmative fairly. To demolish a man of straw of one's own making, is seldom convincing. Yet I will give a few reasons why we should accept the conveyance by a *Stegomyia* host as the only means by which it is naturally conveyed. I say "naturally conveyed," meaning the way yellow fever is contracted naturally during epidemics. The disease can be conveyed, as we have seen, without the mediation of a host by the hypodermatic injection of the blood of the patient, but that surely is *not* a natural conveyance.

Analogy.—Of such diseases as have been fully investigated, all that are conveyed by living hosts are conveyed naturally in no other way. This is a biological law.

Familiar illustrations are malarial fevers and Texas cattle fever, which is very like yellow fever in its epidemiology; and there are a number of diseases of the lower animals thus conveyed, and for all this law holds. The facts observed of the natural propagation of yellow fever agree with this theory and are explained by it.

For instance, the fact that the disease is not directly propagated from the sick to the well, that it is propagated only by means of an infected environment, that a man sick of yellow fever may infect his environment.

By our theory he infects the mosquitoes which bite him, and the presence of these infected mosquitoes constitutes the infected environment.

The existence of infectible and non-infectible places.

An "infectible" place, as you know, is one which, if cases of yellow fever be introduced therein, becomes infected—*i.e.,* capable of inducing yellow fever in those who visit or live there. A "non-infectible" place is one which will not become infected even if cases of yellow fever be introduced. In such a place yellow fever is not a transmissible disease. The theory of conveyance by a host would explain this difference by the presence of the proper host (*Stegomyia*

fasciata) in the one and its absence in the other.

The relation of the spread of yellow fever to cold weather, altitude and excessive dryness. The very conditions under which *this mosquito* —mind you, I do not say "mosquitoes"—thrives best suit the propagation of yellow fever.

The close correspondence of the periods of incubation from infection in the natural way—12 cases observed by myself—with the periods of incubation after mosquito inoculation—24 cases. Yellow fever caused by the hypodermatic injection of blood or strained serum from a yellow fever patient has not shown the same agreement in its period of incubation with that naturally contracted. It may be because this is not a natural method of conveyance.

The existence of a considerable interval seldom under two to 2½ weeks, between the infecting and the first "secondary" cases of yellow fever. I mean that when a case of yellow fever, contracted elsewhere, develops in a non-infected place, no case will develop from the first one until *after* about two weeks, and that then we are apt to have a considerable number together as our first crop. Now this time is decidedly longer than the period of incubation of yellow fever, and since it is an invariable phenomenon, it can only mean that the place requires a certain time after receiving infection from the sick before it becomes capable of inducing yellow fever in others. This of course is the "extrinsic incubation" we have spoken of before, and its usual minimum duration, which had been fixed by observations of yellow fever naturally occurring as somewhat in excess of ten days" (the first secondary cases usually occurring in the third week) is too close to the period, twelve days as a minimum, which Reed observed between the date of the feeding of the mosquito on the yellow fever patient and the date on which yellow fever was conveyable by the same insect, for those periods to be due to different causes. That cause in Reed's cases was the incubation in the mosquito. The same phenomenon is observed with malarial fever—*i.e.*, a certain time must elapse from the infection of the *Anopheles* by the ingestion of the *Plasmodium malariæ* before it is capable of producing the disease in those whom it bites, and so with other diseases caused by parasites conveyed by living hosts.

Indeed, this phenomenon and the fact that some places are infectible, and some not infectible by a yellow fever patient, with no reason which we could assign for the difference, are, taken together, scarcely capable of any other explanation than conveyance by the host.

Indeed I do not know one single fact established concerning the natural propagation of yellow fever which does not agree with the doctrine of its conveyance by the *Stegomyia fasciata* as a host.

3. Measures founded on this doctrine have given the results which were to be expected of them if it were true. And this I hold to be most convincing evidence.

In 1899 and 1900 "campaigns of cleanliness" were waged against the yellow fever in Havana. All the money that could be called for was forthcoming, and all the men. Skilled engineers were in charge with the whole force of military power behind them. In 1899 General Ludlow was in command and Major Davis was chief sanitary officer; in 1900 it was General Wood and Major Gorgas. And I can give you my word that the work was well done. Havana was as clean as a cobblestone-paved city can be kept. We began, too, with a city almost free from yellow fever. There had been but 31 deaths from yellow fever among civilians the year ending March 31, 1899, and there were only five more in August.[1] The fever then spread, and we had that year to March 31, 1900, 111 deaths among the civil population. Less than normal, but just the same number as in 1885, when no sanitary measures were used. In 1900 the work was, probably, better organized and was certainly as well done, yet the deaths that year were 301, although this includes some among the military—say 12 or 15. The average civil death rate from yellow fever in Havana for the ten years prior to the war was 211 per annum. We had then this year more deaths among the civil population than normal in Spanish times; nearly one-third more. Indeed 1900, after all our work, gave a *higher civilian mortality than any one of the ten years prior to the war except 1893.*

Now, during this time Havana was as clean as it could be made. Patients were isolated to some extent; all whom we could get to go were moved to hospitals—probably 75 per cent.—and the premises carefully washed down with bichloride of mercury, and the fabrics disinfected by steam or bichloride or boiling. Yet, as I tell you, we had an epidemic. So far as yellow fever was concerned, the sanitary work was a failure. The next year, the plan was changed. The *Stegomyia* was accepted as the only means of conveying yellow fever and all effort was based on this belief. All cases of yellow fever were screened as soon as found, and they were found early and the screens were kept in place too. If the patient went to the hospital, the house was immediately fumigated with either pyrethrum or sulphur. If he did not, it was screened and fumigated as soon as possible; the houses adjacent being also fumigated. This was the key of the plan: (1) To keep mosquitoes from the patient. (2) To kill all mosquitoes which had had access to him.

There was, also, a general war waged against all mosquitoes in town, draining and oiling pools of water; emptying, covering or oiling water in containers. The presence of mosquito larvæ on premises was made a public nuisance and punished by fine.

These measures unquestionably did good and there was certainly a tremendous fall in the mortality in all malarial fevers; but the essential of the work for yellow fever was, as I have said, *to keep mosquitoes from the patient and to kill those which had had access to him.* Nothing else was done. The bedding and clothing of the sick were not touched, nor the bedding and clothing in the houses where they were taken sick. Now the result.

Yellow fever disappeared. There were about the usual crop of cases in the spring, but there was no spread. Some were introduced from Santiago de la Vega and other places outside of Havana, but there was no spread to amount to anything. Cases, a few, were brought on the vessels from Vera Cruz, taken to the yellow fever hospital and screened, and there was no spread. Gentlemen, this was not luck. It was not accident. Havana had had yellow fever for 140 years. It was freed from it in the summer of 1901, *by the measures taken.*

I am glad that the same man, Dr. Gorgas, had charge of the sanitary work in both 1900 and 1901, so that everything should be the same except the *plans of the work* and the *difference of the results*—in 1900 a failure; in 1901, a brilliant success. Could this have happened if there had been any other means of conveying yellow fever except the insect host? What else will screens exclude? What else will insect powder kill? Remember the bedding, clothing, etc., of the patients were not touched.

There has been no yellow fever in Havana since—that is, none contracted there. You know that Havana is in weekly communication with Vera Cruz and other Mexican ports, receiving a considerable number of passengers by each vessel. How has she kept infection from being introduced from these ports? There is a maritime quarantine at Havana just as at all seaports among civilized nations. As Dr. Finlay directs it, the quarantine for yellow fever is naturally based on the assumption that the *Stegomyia* is the only agent of conveyance of that disease to man. Passengers not immune to yellow fever are retained in quarantine across the bay five days from their last presumable exposure to yellow fever before they are allowed to enter the city. Vessels which may be infected with yellow fever (*i.e.*, which may have infected *Stegomyiæ* on board) are not allowed at the wharves or to be boarded by non-immunes until after fumigation to destroy mosquitoes.

Baggage of all kinds from Vera Cruz, Tampico, and Merida, even that of people sick of yellow fever, is passed without disinfection.

People arriving with yellow fever are taken at once in an ambulance screened with mosquito wire, to the yellow fever hospital. This is a ward screened and with double screen doors in the general hospital in the city of Havana. A number of such cases have been thus treated and there has been no spread. No spread was expected by those in charge, and I venture to promise that there will be no spread as long as the present system is carried out.

Look at this quarantine! With passenger traffic, from infected ports, with its protective measures directed only against mosquitoes; with absolutely no disinfection of baggage and yet giving a perfect result.

The same regulations had been in effect at a number of our southern ports, those of Virginia, North Carolina, Georgia, Florida, and Mississippi, the past year—for the United States regulations are also based absolutely on this doctrine, and require only what is given above—and with the same result. Could this be if yellow fever were conveyed in any way except by an insect host? Could it be if fomites could convey yellow fever?

Fomites! A while ago I said I knew of no fact in the propagation of yellow fever which was not consistent with the doctrine of its propagation by a host. I am sure some of you thought of "fomites" then. I promised not to set up a man of straw and demolish him, and yet, as I used to believe in this means of conveyance myself, it may be that the arguments which convinced me that I was wrong may have weight with some one who believes as I did. Obviously, if yellow fever can be conveyed by formites, the doctrine that it is only conveyed naturally by a mosquito host, is untrue.

I believed it, the conveyance by fomites, (1) from the analogy with other infectious diseases, smallpox, measles, etc., and (2) because everyone else did. The doctrine was not disputed and I did not examine the evidence for it critically. Yet even before Reed's first paper, I had come to rather more than doubt—almost to disbelieve—that *fabrics* conveyed yellow fever, although I *knew* that *ships* did. My mind was not changed simply to accept this theory. In the first place, all the yellow fever outbreaks which I myself could trace, a man sick of yellow fever was the starting point. There were many which I could not trace. In some such outbreaks, fabrics from infected places had come in, and in the vast majority no such fabrics could be traced. None of the reported cases of conveyance by baggage which I could personally investigate, excluded other means of conveyance.

Then I found that for the 220 years preceding 1899, the baggage from Vera Cruz, Havana, and Santiago de Cuba on vessels arriving at New York, unless with yellow fever en route, entered without disinfection. The amount of this baggage from Havana and Vera Cruz was large, and it was not impossible but that much of it came from houses infected with yellow fever, and much of it was not clean. All of this baggage was presumably opened at the custom house at New York, and it was opened at hotels there and at Saratoga, and no yellow fever was reported among the customs inspectors in New York, or at the hotels during this time.

The baggage going from the same ports to Spain for the twenty-nine years preceding 1899, was even more to be considered. Its amount was enormous. Much of it must have been foul. Yet no yellow fever was reported in the Peninsula since the epidemic of 1870.

Of course, negative evidence is convincing only in proportion to its mass, and that a piece of baggage, or 100 pieces of baggage, from an infected place did not convey infection to those exposed to it, means little, yet the amount of this baggage was so large—I cannot estimate it at less than that of 300,000 persons from Havana alone, not to count Vera Cruz and southern Cuba —that we must claim that a very large amount of baggage from infected houses had been introduced into New York and the Spanish towns; that numbers of susceptible people had been exposed in these places under various conditions, but had *not* contracted yellow fever.

To me the mass of this evidence was sufficient to be convincing, and I counted it *proven* that baggage from Havana and Vera Cruz would not convey yellow fever to people in New York or Spain, nor could I deny that baggage did not convey yellow fever in New York or Spain, but it would do so in the South. I knew that yellow fever was communicable from a sick man only by infecting his environment and hence only in an "infectible locality," but the contrary had always been the teaching for fomites. That infection could be *directly* conveyed to man by fomites is the doctrine which had been universally taught. All the instances reported of conveyance by fabrics of which I had cognizance were either explicitly ascribed to, or explicable by, this direct conveyance. Now, if the "infected" fabrics could convey yellow fever directly to men, obviously they would convey it to susceptible people who come into direct contact with them in any place whether the locality be "infectible" or "non-infectible." Therefore, as against the possibility of direct conveyance of yellow fever from fabrics to men, the data from New York and Spain, which I have given above, if conclusive for those places, were conclusive against such conveyance in places known to be "habitually infectible."

As to the positive instances of conveyance by baggage, which had been reported, none that I was able to inquire into personally certainly excluded other methods of conveyance. The reporter begins with the assumption that yellow fever is conveyed by fomites, and as soon as he can show the introduction of fomites from an infected place, he is satisfied. He looks no further for any other source of infection. Strange to say, the best-attested cases I came across were not those of conveyance by *packed baggage,* but by *clothing worn on the person,* sometimes for a number of hours, through the sun and air, which was against all other experience of this disease.

Also it is common sense that when there is a great mass of negative testimony on a subject, all tending one way, we may not accept a moderate amount of positive evidence in rebuttal unless its data be conclusive, and I thought the evidence of the Cuban and Mexican baggage great enough for this rule to apply.

Note, too, that the argument for conveyance by fabrics was really a negative one. The reporter says "there was no possible source of infection except the fomites." He means that he knows of no other. Exactly the same argument was used, and logically, for the spontaneous origin of yellow fever. Cases were cited for which no exposure to *any* source of infection could be made out, and the statement was made that there *was* no exposure. From this, if admitted, the admission of the "spontaneous origin" of the cases was a necessary consequence. These cases were (indeed are) not a few. They were reported with as much detail, and with as much care, and by as good men, as those for which no exposure except to fomites was known. The argument for the spontaneous origin of yellow fever, and that for its conveyance by fomites, both depend on our accepting that there were no exposures unknown to the reporter. They stand or fall on the same class of evidence.

As to the cases of infection carried by clothing worn on one person, which I have said seemed the best stated of all which I had cognizance, I know that a large number of passengers had been coming during all seasons of the year from 1888 to 1898—ten years—from Havana to Key West and Tampa, with no disinfection of the clothing they are aware of, and yet Key West and Tampa had kept free from yellow fever. It was not possible that the thousands who thus came over should have carried no infection if clothing worn on the person could carry it. There must then be some other explanation for the few cases reported in the United States. I think, then, that I was right to count the conveyance by fabrics as "not proven" on this evidence.

In addition I did not have what you now have: (1) The experiments of Reed, of Ross, and of the Pasteur Institute Commission. In these a number of persons were exposed for days and nights to bedding and clothing used in every conceivable way about yellow fever patients. None of these people developed yellow fever from exposure, although a number of them did when subsequently bitten by contaminated mosquitoes. To be fair, I wish to admit here what the fact that Reed's experiments with fomites were done late in the year detracts from their value. This, however, does not apply to the other two. (2) The freeing of Havana from yellow fever by Gorgas, although the clothing and bedding were not disinfected. (3) The continual experiment which the Havana quarantine and many of our own stations have been giving us in letting in baggage from yellow

fever ports without any disinfection, and yet with no introduction of yellow fever.

Note that in these last two the fomites which did not convey infection were in infectible places in the yellow fever season.

If I had had all this evidence in addition to that which convinced me, I would, I think, scarcely have considered conveyance by fomites worthy of discussion. And that whether I knew of any other method of conveyance or not.

Let us see what we have said. There is no question in any man's mind that the mosquito *Stegomyia fasciata,* acting as a host, does convey yellow fever from the sick to the well. That this is the only method of conveyance, the argument is: (1) The analogy of other diseases conveyed by living hosts; (2) that the facts observed of the natural propagation of yellow fever agree with this theory; (3) that measures based on this theory have given the very results which they should have given if the theory were true; (4) no other natural method of conveyance is proven.

ENDOTRACHEAL MEDICATION.[1]

BY J. J. RICHARDSON, M.D.,
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THE successful treatment of many of the diseases of the respiratory organs, notwithstanding the rapid advances within recent years in their pathology and bacteriology, is a problem yet unsolved. Any advances along these lines are of more than passing interest, not only to the profession, but to the laity as well. While the surgeon has been penetrating all the cavities of the body with impunity, the practical therapeutist has been none the less aggressive, and among other things has taught us to look upon the larynx as an open door to a new field of medication.

We have in intratracheal injections a valuable method of treating many of the inflammatory and infective diseases of the lower respiratory tract. Those who do not employ it are depriving themselves of a most effective means of medication. It is simple, safe and practical. Diseases below the larynx, owing to the prevailing opinion of their inaccessibility and sensitiveness to local treatment have been treated mostly by internal medication. Sprays and vapors have been used to a considerable degree and can be made to penetrate quite deeply, but the quantity of the drugs reaching the parts is so small that as a rule little real benefit results. We all favor the local treatment of diseases of the nose, pharynx and larynx, and it is only rational that similar changes taking place in more remote parts should not be treated along the same lines and with equally satisfactory results. It is entirely practicable to medicate the whole bronchial area and reach portions of the lung by absorption through the pulmonary lymphatics.

The first impression naturally is that violent coughing would be produced, but this is erroneous. Indeed, it usually produces no more disturbance than an ordinary application to the nasopharynx or larynx. The usual objections urged against it are groundless. Some claim that it possesses no therapeutic value, others that serious interference to the function of respiration may result, that it produces nervous shocks, spasm of the glottis, etc.

The technic of the injection is simple. The patient should be seated in front of the operator, the light placed along the side of the head, the mouth held wide open, the tongue protruded and held firmly by the patient. With a frontal mirror the light is focused on the pharynx—a laryngoscope placed in the illuminated zone which gives the image of the epiglottis and glottis. The canula of the syringe is then directed over the epiglottis, and during an inspiration by making a sort of see-saw motion of the syringe from below upward, is made to penetrate between the vocal chords and pass the first rings of the trachea. The syringe is then relieved of its contents, while the patient inhales slowly and deeply. This is the all-important point to be observed in making successful injections. Only rarely is severe coughing produced, and when it does occur is often due to the unskilful introduction of the fluid.

In hypersensitive throats it is frequently necessary for the first few treatments to use a two-percent. solution of cocaine as a spray to overcome the pharyngolaryngeal reflex. There are patients who can be successfully injected by simply depressing the tongue and guiding the syringe directly over the tip of the epiglottis into the larynx and trachea. I have practised this method frequently in cases where the pharyngeal reflex was not hypersensitive with just as satisfactory results as where the mirror was employed. I have had no experience in treating children by this method.

The success in making the injections will depend in no small measure on the selection of the syringe. The one which I have found most satisfactory, and the only one, is Shradel's, manufactured by Tiemann & Co., of New York. It consists of a glass barrel inclosed in metal and having a spiral spring attached to the piston. When the syringe is filled with the liquid for injection, it is relieved of its contents by gentle pressure with the index finger on a small spring, that allows the liquid to flow out quickly or slowly, according to the will of the operator. The canula is about eight inches in length, and is of the proper curvature for its introduction and passage through the larynx.

The selection of the medicaments for injection is of paramount importance. In general they should be antiseptic, stimulating, non-irritating and soluble in the vehicle employed. In the early days of intratracheal medication watery and mucilaginous solutions were used, but they proved too irritating. Within recent years oily solutions have been employed, with results that

[1] Read before the Clinical Society, Washington, D. C., April 11, 1904.

warrant their continuance. The therapeutic agents that I have used mostly have been the volatile essential oils eucalyptus and thyme, combined with menthol, camphor, creosote, iodoform or orthoform, according to the indications of the case, with sterilized olive oil as a vehicle. By the use of the oils in this way, we get a *double action.* They are absorbed and then re-eliminated by the pulmonary mucosa—thus insuring modification of the whole subglottic breathing tract.

Various experiments have been conducted on human beings and inferior animals, demonstrating the rapid absorptive and eliminating function of the bronchial mucous membrane. The injections should be given daily, and one or two drams of the liquid may be injected at a time. I frequently give two or three injections at one sitting. A great factor in favor of this treatment is that it does not disturb digestion or interfere in any way with other treatment which it may be desirable to carry out in conjunction with it. The diseases treated have been bronchitis, bronchial asthma, tracheitis, bronchiectasis, and pulmonary tuberculosis. Its greatest field of usefulness is in the treatment of bronchitis. The mixture which has proven in my experience the most beneficial in this class of cases is five per cent. campo-menthol with eucalyptus and thyme and sterilized olive oil, or a highly refined bland petroleum. In the acute congestive stage it produces coughing, but as a rule it lasts only a few minutes, and the soothing effect which follows is very grateful to the patient. A few injections will frequently entirely relieve the cough and expectoration.

There are a great many people who have the so-called "winter cough," which develops as regularly as autumn comes, and in spite of all cough mixtures, persists till the warm, balmy days of spring. All these patients have a chronic bronchial catarrh, and improve more rapidly under the injections than any other method of treatment with which I have had any experience. No other treatment gives such prompt relief in the chronic bronchitis of alcoholics and the acute attacks which so frequently follow dissipation. Again we have the bronchitis or "bronchial weakness," we may term it, in smokers and "high livers." These patients are not successfully relieved by internal medication, but the cough, expectoration and dyspnea, a symptom which they almost all have—can be best controlled by direct medication. It is not every case of bronchitis, however, that is adapted to this treatment, nor will it ever entirely replace the older methods, but it does offer an additional means of medication whose usefulness I am sure will be appreciated as experience with it increases. In tracheitis where the laryngoscope shows the mucous membrane to be congested—the presence of scales of adherent mucus, and where there is a dry hacking cough, the injections are just as efficacious as in bronchitis.

In a few cases of bronchial asthma the acute symptoms were quickly and satisfactorily relieved, and there was notable lessening in the frequency of the attacks. The addition of a few minimums of compound tincture of benzion and chloroform to the menthol, eucalyptus and thyme is valuable. I have treated three cases of bronchiectasis by injections of the oils with the addition of iodoform, in which there was for a time marked relief following the treatment. The mucopurulent expectoration diminished, and there was a rapid decrease in the cough.

As to tuberculosis: Intrapulmonic injections, like so many other treatments for this terrible disease, have not proven by experience to be all that was hoped for in the beginning. In most cases nothing more than temporary relief can be expected. The injections have no specific effect. I am led to this conclusion by carefully observing the results of treatment in forty-five cases of the disease where the diagnosis was confirmed by bacteriological examination. I can recall a few instances where for a time the tubercle bacilli disappeared from the sputum. It was only temporary. We have in it, however, a means of alleviating the local and general symptoms of the disease in many cases better than by the internal administration of drugs. It controls the cough, decreases the expectoration and changes its character. In this way secondary infection is overcome to a great degree with a corresponding decrease of the fever and the night-sweats. Most of the patients will speak of a general sense of relief following its use. The breathing will become easier and the feeling of constriction about the chest so frequently present is greatly relieved. Many of the patients have spoken of this and the relief lasts from twelve to twenty-four hours after the treatment. It doubtless results from the local anesthetic effect of the menthol on the nerves of the bronchial mucous membrane.

Of course the dyspnea resulting from pulmonary disorganization of advanced disease is not benefited. Where there is laryngeal complication I believe the benefit is most marked, and in every case we are warranted in using it. Owing to the sensitiveness of the parts it is well to add to the compound of volatile oils, menthol and creosote, soluble hydrochlorate of orthoform for its local anesthetic effect as well as for its antigermicidal property.

Injection of Osmic Acid for Tic Douloureux.—The case of a woman, seventy-one years of age, who presented an intense tic involving the right side of the face, is reported by J. R. EASTMAN (*Jour. Am. Med. Ass'n*, Sept. 24, 1904). The attacks gradually worse for the past twenty years, and the usual remedies had been found ineffectual. A two per cent. solution of osmic acid was then injected into the supra-orbital, infra-orbital and dental nerves, in the manner recommended by Dr. J. B. Murphy. Ten drops of the solution were injected into each branch and two to three drops forced into the perineural fat around the nerves at their foramina of exit.

MEDICAL PROGRESS.

SURGERY.

Dermatitis of the Hand After Use of X-ray.—A severe case occurring in a physician who had employed the rays continuously since 1897, is reported by R. MÜHSAM (*Arch. f. klin. Chir.*, Vol. 74, No. 2), During the winter of 1900-01, a dermatitis was observed, accompanied by scaling of the skin and localized temperature. Patient then ceased to employ the rays. The condition nevertheless grew worse, the nails became brittle and showed irregular growth, the skin was dry and the hair fell out. The index finger of the right hand was most affected. Here a paronychia resulted and the nail had to be removed. The wound failed to heal and an ulcer remained, which was very painful and gradually extended, causing so much discomfort that the patient begged amputation of the finger. This was done, but the wound did not heal until nine weeks later. Examination of the digit microscopically showed the most marked changes in the vessels. The intima was very much relaxed, the endothelium swollen, and the surrounding tissue was markedly infiltrated. The changes amounted to an obliterating endarteritis. In the partial or complete obliteration of the vessels must be sought the reason for the slow healing of the ulcer.

The Treatment of Chronic Colitis.—The treatment of this condition should essentially be based on the etiological factors, according to B. V. BECK (*Arch. f. klin. Chir.*, Vol. 74, No. 1). He thinks that the diagnosis of chronic colitis due to a nervous state is insufficient, and the latter is usually the result of the colitis itself. Among 500 cases observed by the author, he found chronic inflammations present in the neighborhood of the colon in 394, and the cure of the colitis depended more or less on their removal. Of these the most frequent were perityphilitis, diseases of the gall-bladder and stomach, and lesions of the female genitalia. The cause of the colitis may also be found in local lesions—carcinoma, tuberculosis, or actinomycosis. In several severe cases after the failure of all other methods of treatment, the writer employed operative means, by which he established an anastomosis between the lower end of the ilium and the sigmoid flexure, cutting out in this wise from the intestinal tract almost the entire length of the large intestine. In five cases he had excellent results, in the sixth he used the Murphy button, which sloughed out, with consequent fatal peritonitis. Beck makes the following propositions based on the results of his experience, in formulating treatment for any given case of chronic colitis: (1) The cause of the colitis should be carefully determined in each instances and the treatment instituted accordingly. (2) If the colitis is the result of neighboring inflammatory processes, these should be attended to and if necessary by operative means. (3) When a carcinoma, tuberculosis or actinomycosis is the cause of the colitis, the local lesion should be attacked by radical or palliative operations (recection, entero-anastomosis, colostomy). (4) Colitis found to be of different origin must be treated in a symptomatic dietetic manner. (5) Obstinate cases, which are not improved by these measures, should be subjected to the operation previously suggested. Beck claims that the large intestine is of comparatively little value in the human economy, being merely a remnant of a herbivorous type. By its tendency to the production of chronic inflammations and malignant growths, it furnishes an element of danger to the body, and may be readily cut out of the intestinal circuit without causing any disturbance in the economy of the system.

Postoperative Intestinal Obstruction.—Nothing is more discomforting to the patient nor disquieting to the surgeon than the failure of an operation, which has at the start seemed eminently successful. CHARLES H. PECK (*Annals of Surgery*, October, 1904) concludes that the possibility of postoperative obstruction should by no means be lost sight of after any intra-abdominal operation, but particularly so after such operations complicated by general or pelvic peritonitis. All raw surfaces should be covered with normal peritoneum, perhaps with cargile membrane, or by carefully arranged omentum. Small incisions and the gentlest manipulation are specifically indicated. The smallest possible drains should be used, if any; cigarette drains being vastly preferable to gauze. In the class of cases referred to, special care should be taken of the patient for the first few weeks of convalescence, particularly in the matter of regulating the bowels and the diet. Attacks of gaseous indigestion with colicky pains should be regarded with suspicion and treated with vigor. This treatment consists in giving enemata, gastric lavage, limited food, and posture. If, after a few hours' trial, palliative measures are unavailing, operation should be done at once, but it cannot be too positively stated that since these attacks of obstruction are usually partial in their incipiency, and are complicated either by late inflammatory swellings or by actual blocking of the lumen with coarse food, a great majority of them can be immediately and permanently relieved by palliative treatment.

Treatment of Hematemesis.—A great deal has recently been written on this subject which would justify one in believing that the sole prerequisite of the successful terminating of blood vomiting is gastro-enterostomy. F. G. CONNELL (*Annals of Surgery*, October, 1904) states that when such high authorities as Moynihan and Robson speak as they do in favor of gastro-enterostomy, it is but natural that the trend of surgical opinion is largely determined by their views. Moynihan says a gastro-enterostomy will prevent recurrence of the hemorrhage and lead to a rapid healing of the ulcer from which the blood comes. Munro has recently published the details of four cases of hemorrhage treated by gastro-enterostomy. All were followed by death. This fits in very pointedly with the belief of Moullin, who, in speaking of this operation for the relief of hemorrhage, says: "It is at best only a way of abating difficulties, which are better met directly, before they have attained dimensions which render this impracticable." Carcinoma, as a very prevalent, late occurring sequel is not the only contra-indication to this form of treatment. Many cases are recorded, including one by Connell, in which death was due to hemorrhage, which continued uninterruptedly after the operation. It hardly seems logical to believe that the mere putting of the stomach at rest to the degree of which gastro-enterostomy is capable, would suffice to stop hemorrhage from a good-sized eroded gastric artery. It follows, therefore, that in all cases, where it is practical so to do, radical treatment of the bleeding points should be attempted. Gastro-enterostomy is therefore indicated, first, if after a thorough search, the bleeding points cannot be found; second, when conditions are such as to make direct treatment impractical.

Sacculated Aneurism of the Aorta.—Since it seems quite possible that the Matas technic may before very long be called upon to invade the hitherto prohibited thoracic and abdominal aneurismal territories, all reports of cases treated by the older coagulation methods become doubly interesting. HAMILTON A. BALANCE (*Lancet*, October 1, 1904) reports the case of a laborer, forty-four years old, for eighteen months had had a gnawing pain in the front of the chest on the right side. This pain was invariably worse after exertion and had at the time of operation become almost unendurable. Prolonged characteristic cough had practically in conjunction with the pain, obliged the man to give up work. Contrary to the usual belief, that syphilis is an almost invariable accompaniment of this form of aneurism, no such history could be obtained from the patient. On physical examination, the left pupil was larger than the right. The pulse was 64 and synchronous in both wrists. The chest bulged over the third and fourth right costal cartilages. Under medical treatment there was improvement. This, however, shortly disappeared, after the patient had begun to work. Two months later the tumor had almost doubled in size and the point of cardiac impulse was in the sixth space, half an inch outside the nipple line. The respirations were 30 and labored. In view of unendurable pain and of the unprecedented rapid growth of the aneurism, operation was finally decided upon. The skin was anesthetized with eucaine and a fine hollow needle, which just passed No. 9 silver wire, was introduced three inches into the fourth right intercostal space one inch from the border of the sternum. The wire was insulated by being passed through shellac. After the needle had entered the sac, the blood spurted over a foot high. Eight feet of wire were then passed into the sac. It had previously been wound in coiled form around a towel. It was shown experimentally that the wire would coil itself when unreeled from the towel through the needle. It took seven minutes to introduce the wire and there was irrgularity both in the rhythm and in the force of the pulse at the wrist, but the patient made no complaint. A constant current was passed into the sac for forty-five minutes, the end of the wire projecting being connected with the positive pole and an electrode being applied to the thigh. For the first fifteen minutes the current was five volts, 24 milliampères; for the next twenty minutes 10 volts, 42 milliampères. For the last ten minutes five volts, 28 milliampères. When the current was turned off, the end of the wire was pushed through into the sac, the needle withdrawn and the puncture sealed. For a quarter of an hour, the patient was comfortable, but after that he began to feel faint, to sweat profusely and to vomit. The pulse became feeble and irregular and fell from 96 to 50. At the end of the operation there was no diminution in the size of the pulsation of the aneurism. Recovery from this temporary dysgracia was complete and was apparently much aided by strychnine injections. For three weeks the pain remained about as before the operation. Likewise the swelling and tenderness about the sides of the puncture. At the end of the fourth week, however, there was marked diminution in size and morphine was discontinued, the patient being able to get up. Three months from the time of operation, the aneurism was pretty well solidified and all symptoms had abated. The wire in the sac showed very clearly under the X-ray. Three weeks later, however, dyspnea began to be sudden and severe. The respirations were 44. He expectorated blood-stained mucus and general edema developed. The aneurism at this time felt solid. He died on August 11, nearly ten months from the time of operation. The heart was greatly hypertrophied. The sacculated aneurism from the first part of the arch of the aorta was found. It was filled with a white clot in which the silver wire was coiled. Loops of wire also passed as far as the origin of the left common carotid and down to the bottom of the left ventricle. The wire had passed immediately after insertion into the ventricular cavity. The operation certainly prolonged life and prevented the patient from dying from rupture of the sac.

MEDICINE.

Fatal Poisoning Due to Absorption of Nitrobenzol.—A case of considerable interest is reported by W. J. STONE (*Jour. Am. Med. Ass'n*, Oct. 1, 1904) where this agent as an ingredient of shoe polish was absorbed through the skin. The man in question was suddenly seized with a fainting spell, which was succeeded by coma and collapse, with death following about four hours later. An autopsy showed acute desquamative nephritis and hepatitis evidently of a toxic nature. The feet showed marked discoloration. Subsequent inquiry developed the fact that the man had applied a large amount of a shoe polish to the uppers of his shoes and had worn them for several hours before death. Chemical examination of the shoes and the remains of the liquid, revealed the presence in both of large amounts of nitrobenzol. The case reiterates the danger of the promiscuous use of nitrobenzol by manufacturers as a solvent for the anilin dyes, and how more extensive poisoning is prevented among their workmen is a mystery. The case is also of interest as showing how absorption may readily take place through the skin and result in a fatal issue.

Tuberculosis of the Abdominal Lymph-nodes.—Having made an extensive study of this subject, C. F. PAINTER and W. G. ERVING (*Am. Med.*, Sept. 24, 1904) state that the three chief sources of infection are direct extension from adjoining diseased tissues, infection from the blood stream, and infection through the lymphatics. The first is uncommon, the second is not infrequent, but the third is the usual mode. A lymph gland in which a tuberculous focus is present, remains always a source of danger to the rest of the body. The process may extend or remain localized, and it is to complications that in the latter case death is due. These may be, intestinal obstruction, peritonitis, or an outwardly progressing abscess, Among cases with spinal symptoms, mesenteric tuberculosis must be differentiated from Pott's disease, aneurism of the abdominal aorta, cancer, osteoarthritis, osteomyelitis, and other inflammatory diseases around the spine. The treatment of this condition may be considered under three heads, general, mechanical and operative. The first is the most important and includes all the factors which contribute toward the building up of the general system—outdoor life, freedom from labor, extra diet, tonics for the appetite. Even where the spine is not involved, the nearness of the spine to the diseased glands causes irritation and great benefit is secured from the wearing of jackets or spinal supports. Surgically, much the same rules hold good for the treatment of abscesses from broken-down lymph glands, as obtain in the treatment of abscesses from tuberculous bone

lesions. It is very important to prevent them from becoming secondarily infected, and therefore incision should be delayed as long as possible. Aspiration, when they are so situated that this may be done without danger to the viscera, is preferable to open incision. The latter, however, is only possible when strong presumptive evidence exists that the glands are isolated and small in number. But even where the abdomen is filled with a mass of glands, a simple celiotomy may be followed by a great improvement. The authors think that the prognosis is good as compared with that of vertebral tuberculosis in the same class of patients. The most serious features are due to the complications, but much can be done for the patient, according to the extent to which it is possible to provide efficient treatment. Patience and perseverence are also requisite. A series of eight cases is reported in detail.

Pathogenesis of Crisis in Pneumonia.—F. TCHISTOVITCH (*Annales de l'Institut Pasteur*, No. 5) makes a study of the pathogenesis of crisis in fibrous pneumonia. In animals which have suffered from a pulmonary infection, and are on the road to recovery, a leucocytosis, and energetic destruction of diplococci by leucocytes takes place. On the other hand, in fatal infection, much more virulent diplococci are seen, the number of phagocytes in the blood diminishes and phagocytosis does not take place. Repeated experience indicates that crisis of pneumonia cannot be dissociated from the bacteriological property of the fluids of the organism. The blood of a patient suffering from pneumonia during or after the crisis, would not be bactericidal to diplococci of the same disease. Tchistovitch concludes that the blood of a convalescencing patient of pneumonia has not the energetic antitoxic property sometimes supposed. One must admit that phagocytosis is the chief factor in cure of pneumonia. The quantity of alexins in the blood increases during the course of a pneumonia, and reaches its maximum at the moment in which the disease commences the stage of resolution. After this the alexins diminish more or less rapidly. In grave cases with fatal outcome the quantity of alexins does not stand in relation with the total number of leucocytes. In 1887 it was demonstrated that the blood of an acute case of pneumonia, injected under the skin of an animal caused a rise of temperature, but serum from a convalescing case of pneumonia produces no effect.

Cytology of Hydrocele.—In seven cases of chronic hydrocele, Julliard demonstrated a variable number of endothelial cells. Lymphocytes and red corpuscles were sometimes found, but referred to the traumatism of puncture. Liquid from acute gonorrheal hydrocele showed a preponderance of polynuclear elements, but in syphilitic hydrocele, besides endothelial cells, were found lymphocytes, eosinophiles, and polynuclears. OSCAR MARCHETTI (*Gass. degli Osped.* August 7, 1904) reports observations on 30 cases. In simple hydrocele there were few cellular elements. Usually some epithelial cells were present, and lymphocytes. In hydrocele secondary to tuberculosis he finds a high percentage of epithelial cells—25 to 52 per cent., and 25 per cent. of lymphocytes and eosinophiles or polynuclear cells in smaller amount.

Spontaneous Gangrene.—An accompaniment of hysteria—hysterical blindness and paralysis—is rare, but spontaneous gangrene of the skin as an accompaniment to this series of nervous symptoms is very much less frequently seen. W. A. MEARNS (*Lancet*, September 17, 1904) records the history of a patient, aged twenty-four years, who first consulted him for a skin trouble on the lower part of her neck. She was a frail woman and was known to have hysterical tendencies. She had always been irregular in her menstruation, and presented the characteristics which are usually called forth by profound anemia. The appearance of the lesion was in itself not significant. It was simply a dark-red area the size of a ten-cent piece just above the middle third of the right clavicle. The subjective disturbances which had been observed at the time of its appearance were simply a burning sensation over the region. A tentative diagnosis of herpes was made and treatment accordingly instituted. The author did not see her again for a week, at the expiration of which time he was called, her neck having become very much worse. It was already gangrenous, and on raising the surface pus could be detected beneath it. Already a second area had developed, somewhat below the primary one, but this had not yet gone on to degeneration. The pain was intense, and morphine had to be administered. Hot boric acid fomentations were applied to the sloughing area, after which the necrosed tissue separated. By the next day a similar condition was to be observed in the area secondarily involved. The dead parts were not unlike those which would be seen after the application of pure carbolic. Subsequently the lesions extended progressively down to the right breast; in each case the size was about equal to that of the first one, and the cycle traversed was the same. In all seven areas were involved. The area by this time was so large that skin grafting was resorted to, but the grafts twice refused to heal. Throughout the temperature was slightly above normal, registering usually about 99° F. On two occasions, however, extraordinary rises took place without any apparent cause, once to 105° F. and the second time to 110° F. Finally, after nearly five months in the hospital, the patient was discharged with the part healed, but with very extensive and disfiguring cicatrices on the neck and breast.

Local Use of Quinine in Hay Fever.—A form of treatment which has been used with success is recommended by H. D. FULTON (*Jour. Am. Med. Ass'n*, July 30, 1904). It consists of the employment of a saturated solution of quinine sulphate, in sterile water, as a nasal spray, and the application to the mucous membrane of the nares of an ointment consisting of quinine and simple vaselin in the proportion of thirty grains to the ounce the applications being made every four or six hours. Spraying the nares will at once stop all symptoms of coryza, but the effect will soon disappear unless followed by the thorough application of the ointment. Where the bitter taste of the quinine is objected to, euquinine is an equally efficacious substitute.

A New Hypnotic.—The amides of the lower fatty acids have a distinct narcotic action which is enhanced by adding bromine and ethyl radicals to the molecule. G. FUCHS and E. SCHULTZE (*Münch. med. Woch.*, June 21, 1904) have manufactured bromdiethylacetamid synthetically and placed it upon the market under the trade name neuronal. It seems to exceed all other hypnotics in efficacy and is safe and not followed by untoward after-effects. The average dose is one gram, to be followed by hot liquids. The drug also acts as a sedative and may be of some value in epilepsy. Like most of these best yet hypnotics it will require much experience to determine its true position.

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THE THIRD ANNUAL REPORT OF THE HARVARD CANCER COMMISSION.

FOUR contributions to the discussion as to the etiology of cancer are presented in the report of the Harvard Cancer Committee made this week before the Boston Society of Medical Sciences. As was the case with the report made a year ago, the work has been largely destructive without obvious constructive facts to replace those opposed,—a condition of things none too satisfactory, but which yet must be gratefully accepted until a better knowledge of the chemistry of tissue metabolism shall allow of positive advance. The work accomplished tends, as heretofore, toward a demolition of the parasitic hypotheses.

The elaborate and painstaking researches of R. B. Greenough and of E. H. Nichols seem to be the most important of the year's work reported. Dr. Greenough has continued his study of the cell-inclusions of cancer. These bodies, supposed by some to be protozoan in nature, are found to be in all probability only vacuoles formed within gland cells. Reporting nearly five hundred examinations made by four observers on various sorts of cancerous growths, on sarcomata, and on different sorts of tissue, it was found that these rounded objects, the so-called Plimmer's bodies, are much more common in gland cells than elsewhere, never occurring for example, in epitheliomata, and never, with a single exception, "proving the rule," in sarcomata. Numerous lantern slides made from drawings were adduced to prove that these cell inclusions are secretory in nature, formed by the aggregation of secreted ganules which collect in masses, degenerate, and lead to the formation of vacuoles in the cytoplasm. These vacuoles almost always appear in the body of the cell between the nucleus and the duct-lumen,—the location where secretory products are most apt to be found. The strongly staining solid masses in the interior of these vacuoles remains to be explained somewhat, however, as does the peculiar structure of the periphery of the bodies.

Of fifty-four implantations of tissues made in guinea-pigs and in rabbits by Dr. Nichols none led to the production of cancer, unless the tissue transplanted was cancerous, in which case the form of cancer reproduced was always identical with that of the carcinoma from which the implanted bit of tissue was taken. All sorts of animals, save the very simplest, are now known to have cancers, but the transference from one animal species to another has never been accomplished, and only in rats and mice has the infection of one individual by another by transplantation been proven to be possible. The statistics do not tend to prove a relative increase of cancer, nor its occurrence in localities or certain houses beyond what chance will quite account for. This result corroborates that of the English cancer commission reported last spring, and in general the trend of the work is the same, namely, toward the non-infectiousness and the metabolic nature of this deadly scourge.

W. C. Howe and Robert Vose presented a careful and instructive summary of the observations made at the Massachusetts General Hospital on the effects of Roentgen rays on cancers, especially on those of a superficial location. This paper is distinctly discouraging as concerns the curative effects of this agent on malignant growths of a cancerous nature. In a fair proportion of cases epitheliomata have been apparently cured, but more often than not the effect has been by what is practically cauterization, by a slow burning away in toto of the diseased area; and for this purpose the knife is both more prompt and more certain. In the cases treated up to the limit of commencing tissue-destruction

the therapeutic effect was usually found to be only palliative, recurrence occurring as it would after incomplete removal by the scalpel. Deeply seated cancers appear to be wholly beyond the influence of the rays.

Dr. F. B. Mallory, the recent describer of the protozoan of scarlatina, offered a contribution to the classification of tumors based on the long fibrils found to connect three sorts of cells, namely, neuroglia, unstriated muscles and connective-tissue cells. This report was only preliminary, and in its matter too complex for report editorially.

Altogether the third year's work on cancer in the Harvard Medical School has been negatively productive, but tends, on the whole, to make even yet more obscure the solution to this one of the deepest as it is one of the most vital problems of medicine. It is to be hoped that the further work undertaken, perhaps not by the pathologists, but by the embryologists and physiological chemists, will contribute more than a bar to progress in one direction, namely, some help along the direct road to the goal of the truth, to the vast benefit of suffering man and brute.

SERUM DIAGNOSIS OF CARCINOMA OF THE STOMACH.

UNTIL quite recently it has been tacitly assumed that during the process of precipitation of antibodies the immune serum represented the active, and the immunizing solution the passive reagent. In other words, it was thought that the precipitate which results upon the addition of immune serum to a solution of the immunizing substance was formed at the expense of the latter.

Through the researches of Moll,[1] and, more recently, those of Maragliano,[2] this view has been disproven, and it has been demonstrated quite conclusively that the reaction follows exactly the opposite course. During the process of precipitation accordingly the immune serum plays the passive and the immunizing solution the active rôle.

This fact is of fundamental importance in the application of the reaction in the serum diagnosis of malignant disease, which has of late been repeatedly essayed. Engel and Kullmann, whose work antedates the observations of Moll and Maragliano, and was based upon the older conception of the course of precipitation, thus only arrived at negative results. They found that rabbits that had been immunized with blood-serum of carcinomatous patients or with extracts of carcinomatous tissue, furnished a serum which yielded a precipitate with all albuminous solutions, no matter whether these were derived from carcinomatous or non-carcinomatous individuals. Considering the nature of the immunizing agent, this result was of course to be anticipated, even though the exact cause of the precipitation reaction was not then understood. But granted that the principle of the method were applicable for diagnostic purposes, it would have been necessary, in the light of Moll's and Maragliano's researches, to first precipitate the immune serum with dilute blood-serum from non-carcinomatous individuals, so as to remove all precipitations which were referable to the human serum as such. If then the immune serum were to furnish a precipitate with carcinomatous blood, the reaction might possibly be regarded as specific for carcinoma.

Satisfactory researches in this direction are as yet wanting. Analogous experiments, however, have recently been performed by Maragliano, in which the serum secreted from ulcerating carcinomata of the stomach was used for immunizing purposes. The technical details are the following: A patient with carcinoma of the stomach is placed upon a special diet, as suggested by Salomon (*Deutsche medicinische Wochenschrift*, 1903, No. 31). The stomach is then washed out before retiring. The next morning half a glassful of physiological salt solution is given and the stomach contents procured five minutes later. If this solution contains albumin (as shown by the nitric acid test) it is suitable for examination. To this end rabbits are used and injected twice a week with from 10 to 15 c.c. of the washings, ten or eleven injections being made in all. The resulting immune serum is then treated with small amounts of a 1:50 solution of human blood. A slight precipitate usually develops, which, after standing for several hours in the incubator, is removed by centrifugation. The clear supernatant fluid is drawn off and examined once more with a little normal blood solution, so as to insure the complete absence of normal blood precipitations. Finally, the immune, carcinoma-rabbit blood-serum is treated with the stomach washings to be examined, when, according to Maragliano, a precipitate is formed, if the solution under examination comes from a carcino-

1 Moll, L. Hofmeister's Beiträge, Vol. IV, Heft 12.
2 Maragliano, D. Berlin. klin. Woch., 1904, No. 27.

matous stomach. It does not develop, on the other hand, if the stomach contents are not of a carcinomatous origin.

A detailed account of Maragliano's work has thus far not appeared, but it is manifest from the brief survey which has here been given that we may soon be in possession of a method of diagnosis of gastric carcinoma which will in a sense be specific. Whether or not it will render possible an earlier diagnosis of the disease than can be achieved with the methods which have heretofore been at our disposal, time alone can tell. If so, it will represent one of the most valuable results of modern immunity research.

PNEUMONIA ONCE MORE.

WE are entering upon the season of the year when the curve of the death-rate from pneumonia begins one of its sharpest annual inclines and reaches one of its two maxima. There is no doubt that the disease has become one of the most serious that afflicts mankind, and of late years the statistics of its mortality dinned into our ears by many writers, have brought out this fact with incontrovertible certainty. There has even come to be a very general impression that the disease is much more frequent and much more fatal in very recent years than ever before in medical history, and some writers insist that the story of its increasing deadliness can be read very plainly in the municipal statistics of the various boards of health, especially in large cities throughout the United States, and that even since 1900 there is an alarmingly formidable advance easily traceable both in its incidence and fatality.

At the beginning of October the Chicago Board of Health, in its weekly report on the state of Chicago's health, said:

"Pneumonia caused 54.4 per cent. more deaths in 1900 than all the other contagious and infectious diseases combined — including cerebro-spinal fever, erysipelas, diphtheria, influenza, malarial fevers, measles, mumps, puerperal fever, scarlet fever, smallpox, typhoid fever and whooping-cough, the total of which was 2,196. In 1903 it caused 87.7 per cent. more than these diseases combined, the total of which was 2,466 in 1903."

This has its very serious aspect, and yet we doubt if the condition of affairs is quite as appalling as statistics would seem to indicate. It was an irate medical man who, like David in his wrath, said, not that all men are liars, nor that all statistics were lies, but that there were three kinds of lies: plain, ordinary every-day lies, blank lies, and statistics. As a clever medical man has recently put it, figures do not lie, but lies may figure in statistics. There seems no doubt that an analysis of the statistics would greatly reduce the apparent increase in the death-rate from pneumonia. In recent years physicians, especially in large cities, have become much more exact in their declarations in death certificates as to the cause of the deaths of patients. This is especially true for the very young and the old.

In the not very recent past old age figured as a prominent cause of death in statistics, while now it is the terminal pneumonia that the more accurate diagnostician very properly sets down as the cause. In children, pneumonia was not set down as the cause of death in most of the children's diseases, if it came only as the terminal complication of them. This was true also with regard to consumption before so much attention was devoted to it. It is not infrequent now to find that a physician, who has been treating a patient for tuberculosis of the lungs for several years, will state on the death certificate that the direct cause of death was pneumonia, though the indirect cause may be set down as tuberculosis. The physician is usually right in this, for in young persons particularly it is an acute exacerbation of their pneumonic condition that often causes death. Perhaps many of us are also influenced by the fact that a great many of the middle class in our large cities are insured, and their friends would distinctly prefer that the word pulmonary tuberculosis should not be put on the death certificate, and we yield the point and stretch our consciences as far as the word pneumonia.

While the municipal statistics of many large cities would seem to indicate a very great increase in mortality from pneumonia, physicians in active practice for many years insist that this increase has not been brought home to them. Of course this is a vague objection to be urged against exact and carefully collected and scientifically collated figures. At the last meeting of the American Medical Association, however, some forcible opinions of well-known clinicians with regard to this matter were expressed when the question of pneumonia was under discussion. Among conservative Eastern physicians at least, there seemed a consensus of opinion that the scare with regard to the increase of pneumonia was being overdone.

There is, of course, one very decided objection

to the publication of such statistics until they have been absolutely determined to be true, and so are likely to do good rather than harm. Newspapers get hold of these startling figures and use them as sensational scare heads. The result is that many a man, when told that he has pneumonia, practically gives up all hope of recovery at once. In respiratory diseases, more than any other form of affection, courage and confidence on the part of the patient is of prime necessity for hopeful therapeutics and for a favorable prognosis. The widespread publication of the apparently great increase of fatality of pneumonia in recent years is likely to add seriously to the number of fatal cases.

While, then, the new "Captain of the men of death," to quote Prof. Osler's expressive phrase, deserves the most earnest attention in the hope that some method of hindering his fearful ravages may be found, it seems extremely inadvisable to insist on calling public attention to the matter so vividly. Physicians, sanitarians, municipal health authorities and those engaged in questions of hygiene, now know of the fatality as exhibited in statistics, and we may hope for further confirmation of the figures, but until certain factors that enter into the problem have been eliminated by time and patient research, we cannot know the absolute truth in the matter, and until then the sensational publication of the apparent increase seems utterly inadvisable.

ECHOES AND NEWS.

NEW YORK.

Removal of Dr. W. E. Bullard.—Dr. William E. Bullard, formerly of this city, and for the past five winters the Resident Physician at the Colonial Hotel, Nassau, Bahamas, has been offered and has accepted a similar position at Palm Beach, Florida, where he will be after December 23.

City's Lowest Death Rate.—Dr. Thomas F. Darlington, Commissioner of the Health Department, announced at the board meeting last week, that the death rate for the week ending last Saturday was the lowest ever recorded in the history of Greater New York. It was 14.46. The number of deaths was 678, and the basis of estimated population 3,570,012. Dr. Darlington said that, in response to petitions by the hospital patients on North Brother Island, he will make an effort to have a chapel for their use built there.

Dr. Dold Goes to Falkirk.—Dr. Wm. Elliott Dold begs to announce to the medical profession, that he has accepted the position of medical superintendent of Falkirk, Central Valley, Orange County, N. Y.

Honors at Columbia.—Among those of the medical profession to receive honors from Columbia, at her one hundred and fiftieth anniversary celebration, were, Drs. William H. Welch, Andrew James McCosh, Walter B. James, Francis Delafield, Edward G. Janeway, John G. Curtis, William M. Polk, who received the honorary degree of Doctor of Laws, and Drs. M. Allen Starr, L. Emmett Holt, W. S. Halstead and George S. Huntington, who received the degree of D.Sc.

Wood Alcohol Finds.—The Board of Health has found some wood alcohol in whisky, now that the horse has been stolen. They have recently had arrested a saloon-keeper in whose whisky wood alcohol was present, and the trial is now on.

Banquet to Sir Felix Semon.—More than one hundred throat specialists assembled in Delmonico's last Tuesday, at a banquet in honor of Sir Felix Semon, physician extraordinary to King Edward VII, who was a guest of the section of laryngology of the Academy of Medicine. Sir Felix has just returned from a month's hunting in Canada, after delivering an address before the Congress of Arts and Sciences at the World's Fair, in St. Louis. The banquet was presided over by Dr. Harmon Smith, the special committee in charge of the entertainment being composed of Dr. J. W. Gleitsman, Professor W. K. Simpson, Dr. J. E. Newcomb, Dr. Walter E. Chappell and Dr. Emil Mayer. Prominent throat specialists were present from Baltimore, Washington, Philadelphia, Harrisburg, Boston, Springfield, Troy, Utica, Albany and Buffalo. Toasts were responded to by Dr. Harmon Smith, Sir Felix Semon, Andrew H. Smith, Professor George M. Lefferts, Dr. C. C. Rice and others. On Wednesday afternoon Dr. and Mrs. Edward B. Dench gave a luncheon in honor of Sir Felix and Lady Semon, and the same night Sir Felix addressed the profession in the hall of the Academy of Medicine on "Malignant Diseases of the Larynx." Thursday afternoon he delivered a lecture to the Long Island College, and the same evening attended a banquet in his honor given by Dr. George Lefferts. This evening Dr. and Mrs. Emil Mayer will give a dinner in honor of Sir Felix and Lady Semon.

Manhattan Dermatological Society.—Regular monthly meeting of this Society, held on Friday, October 7, 1904, at the residence of Dr. W. S. Gottheil, Dr. I. P. Oberndorfer presiding. The following cases were presented: Dr. J. Sobel presented a female adult patient showing squamous lesions along the hair line (forehead) and postauricular regions, which looked typical of eczema seborrheicum, on the body, arms and legs, dry, white glistening squamous lesions, typical of psoriasis. Not guided by the lesions on the body Dr. Sobel would call this case one of seborrheic eczema, but the typical psoriatic lesions on the body justify the question, Have we here a double eruption to deal with, or might not the case be properly classified under the title of eczema seborrheicum psoriasiforme? Dr. Ochs accepts the latter diagnosis. Dr. Abrahams does not hesitate to say that he recognizes two distinct lesions, psoriasis and eczema seborrheicum. Dr. Gottheil spoke of the differential diagnosis and the difficulty of recognizing clinically, at times, the difference between seborrheic eczema, psoriasis, and eczema seborrheicum psoriasiforme. Dr. Bleiman said that eczema, seborrhea, and psoriasis were closely related, although he thought they were two distinct diseases; either condition may assume the characters of the other, in the course of their development or the result of treatment. Dr. Oberndorfer claims there is such a disease as eczema seborrheicum psoriasiforme. The present case he called a psoriasis with marked seborrheic element.

Dr. B. F. Ochs presented two cases: (1) Leucoderma, in a female patient eighteen years old; condition began when three years old; the patches are symmetrical and seen on face, arms, back, pubic and crural regions; patient is a blonde. (2) A male adult, thirty-four years old; patient states he had a sore on penis ten years ago. Seven months ago noticed a small white patch (resembling a mucous patch) on left dorsum of tongue; antiluetic treatment gave negative results; recently the patch became a distinct ulceration and is now painful and fissured. Large dose of KI internally, and Hg hypodermatically produce no effect. Dr. Oberndorfer looks upon it as a syphiloma; he thought the KI and Hg should be pushed and if after a fair trial with heroic doses no effects were discernible, he would entertain a possible diagnosis of epithelioma. Drs. Gottheil, Sobel and Abrahams agree with the latter speaker; the history was misleading and entitled patient to a thorough course of antisyphilitic treatment, before radical measures were entertained.

Dr. R. Abrahams presented a woman with ulcerations on lower legs, resembling syphilitic lesions; other lesions on the elbows assumed the type of tuberculous ulcers; under KI and Hg, the latter got well but the former are getting worse. The skin over upper third of tibia shows old scars and the tibia shows periosteal nodes. Dr. Abrahams believes he has a double infection to deal with. The majority of the members regard the case as specific.

Dr. W. S. Gottheil showed the following cases: (1) Lupus vulgaris of the face, nose, ears and neck, in a male adult, of sixteen years' duration. Under X-ray treatment for three months gave negative results. The nitrate of silver stick accomplished almost a complete cure; the remaining scar tissue produces traction on lower eyelids and the ears. (2) Leucoderma, in an old man (presented at a previous meeting). (3) Lichen planus ruber in a young man of twenty-one years; eruption began three months ago and is now general all over the body; mucous membranes also involved. (4) Deep gumma involving the muscular tissues of the knee in a young male adult. (5) Male, aged thirty-five years; skin always clear up to three months ago, then noticed small rounded tumors along the calves and later involving regions of the wrists and elbows. Other swellings gradually developed; patient is losing flesh and strength rapidly and looks cachectic; presented as a case of multiple sarcoma of skin. (6) Adult, female; general eruption on body, consisting of macules and papules; mucous membranes clear; eruption itching; patient states that three years ago she had an abscess of the breast after childbirth which took a long time to heal; three months ago the same breast had a "sore," which likewise took some time to heal; the latter was of a different nature and is supposed to have been chancre (?). Dr. Gottheil does not hesitate to call the macular eruption a secondary manifestation of syphilis and the nodular eruption he regards as urticaria. Dr. Abrahams said the case was one of erythema multiforme. Dr. Cocks thought the patient had syphilis; the present lesion being a late secondary eruption. Dr. Ochs regarded it as syphilitic eruption and also pityriasis rosea. Dr. Kinch called it a squamous syphilide and an urticaria. The second breast sore spoken of by patient was possibly the initial lesion. Drs. Sobel, Bleiman and Oberndorfer regard the macular eruption as pityriasis rosea and the papular eruption as possibly syphilis. Dr. Gottheil presented photographs of an interesting case of pemphigus foliaceus and a case of Addison's disease.

PHILADELPHIA.

Health of the City.—Epidemics of throat diseases are threatening the city. Diphtheria and tonsillitis are prevalent to an unusual degree, the former especially. Last week there were 18 deaths due to diphtheria and several schools were closed on account of the disease.

Private Hospitals to be Under Supervision.—In the future the seven private maternity hospitals holding license from the Bureau of Health will be inspected weekly by inspectors attached to the Bureau. Every room and each patient will be visited. This action is one of the results of the recent exposures of malpractice by the coroner's office. Heretofore the inspection has been done in a spasmodic manner only.

University Laboratories Completed.—The new medical laboratories of the University of Pennsylvania are now ready for use throughout. The last of the equipment was made possible by a gift of $7,000 from Provost Harrison.

Railroads and Health Boards.—Dr. Benjamin Lee, Secretary of the State Board of Health, says that if all persons having control of great interests and employing many men were as ready to enforce sanitary laws as are the railroad companies, the work of the Board would be greatly simplified. The managers of railroads are ready to accept suggestions regarding precautions against contagious diseases "following out its suggestion that all matters of sanitation connected with railroads, such as care of buildings, heating, ventilation, lighting, cleansing and disinfecting cars and selection of water supplies, should be under the charge of a medical officer trained in chemistry, bacteriology and general sanitation and hygiene, the State Board has appointed the physician-in-chief of each of the great trunk systems running through this State as a special inspector of the Board, having first assured itself of his thorough competency as a sanitary officer. In addition to this, the State Board has named the majority of the corps of medical assistants as deputy inspectors for their several roads."

The Absorption of Fibrin.—At the meeting of the Pathological Society of Philadelphia on October 27, Dr. Joseph McFarland detailed some experiments made to determine if a solvent for fibrin could be produced by the injection into animals of that material. A large quantity of fibrin was obtained from horses that were bled for antitoxin purposes, washed for forty-eight hours in running water, dried, powdered and suspended in fluid for injection. Rats and guinea-pigs were injected but nearly all died of infection. At the suggestion of Metschnikoff he then employed dogs, with much greater success, so far as death was concerned. Experiments lasting over several months, however, failed to produce in the serum of the injected animals any substance that was solvent for fibrin. Dr. McFarland concludes that no solvent of this type can be produced in animal serum by injecting fibrin.

Contributions to Science of Professor Leidy.—A recent publication of the Smithsonian Institution is "Researches in Helminthology and Parasitology" by Joseph Leidy, M.D., LL.D. The various papers of Professor Leidy on this subject make a book of 248 pages. To the collection it added a bibliography

of his contributions to science consisting of 559 titles. The series has been edited by Joseph Leidy, Jr., M.D., and forms a most vauable collection.

Alvarenga Prize of the College of Physicians of Philadelphia.—The College of Physicians of Philadelphia announces that the next award of the Alvarenga Prize, being the income for one year of the bequest of the late Señor Alvarenga, and amounting to about $180, will be made on July 14, 1905, provided that an essay deemed by the committee of award to be worthy of the prize shall have been offered. Essays intended for competition may be upon any subject in medicine, but cannot have been published, and must be received by the Secretary of the College on or before May 1, 1905. Each essay must be sent without signature, but must be plainly marked with a motto and must be accompanied by a sealed envelope having on its outside the motto of the paper and within the name and address of the author. It is a condition of competition that the successful essay or a copy of it shall remain in possession of the College; other essays will be returned upon application within three months after the award. The Alvarenga prize for 1904 was not awarded, no essay of sufficient merit, in the judgment of the committee, having been submitted in competition.

CHICAGO.

Memorial Services in Honor of Nathan Smith Davis.—Tribute to the achievements and character of the late Dr. N. S. Davis, head of the Northwestern University Medical School at one time, and for years the leader of medical thought in Chicago, was paid in memorial services held under the auspices of the Chicago Medical Society, in Powers' Theater, Sunday afternoon, October 23. Dr. John B. Murphy, president of the Chicago Medical Society, presided. The church, represented by Bishop John Lancaster Spalding, of Peoria, Illinois, and Bishop S. M. Merrill, of Chicago, joined with the eminent physician's colleagues in eulogy. The principal addresses were delivered by Bishop Spalding and Bishop Merrill. At the memorial services a letter was read from Mr. Henry G. Foreman, President of the Park Commissioners of Chicago, in which it was announced that, on account "of Dr. Davis' services to the City of Chicago, and because of the high esteem in which he was held by the citizens," the South Park Commissioners had named one of the new parks "Davis Square," in honor of Dr. Davis. It is bounded by Forty-fourth Street, Forty-fifth Street, Marshfield and Hermitage avenues, contains a little over ten acres, and in the park field house a tablet will be placed in memory of Dr. Davis.

Appointment of Dr. Türck.—In November, Dr. Raymond Custer Türck, demonstrator of anatomy in the Post-Graduate Medical School, will go to Alma, Mich., as medical director and business manager of the Alma Springs Sanitarium.

Chicago Gynecological Society.—At the annual meeting, recently held, the following officers were elected: President, Dr. J. Clarence Webster; First Vice-President, Dr. Frank T. Andrews; Second Vice-President, Dr. Henry F. Lewis; Secretary, Dr. Palmer Findley; Editor, Dr. Rudolph W. Holmes; Treasurer, Dr. Charles B. Reed; Pathologist, Dr. Gustav Kolischer; and Councillor, Dr. Emil Ries. The report of the Secretary showed that the average attendance had almost trebled during the year.

Credit to be Given Practitioners in Examinations for Years of Practice.—The Illinois State Board of Health, at a meeting held in this city October 22, adopted the following resolution, which was presented by Dr. J. A. Egan, Secretary of the Board: *Resolved*, That the rules of the State Board of Health, adopted July 11, 1899, regarding the character of examinations, are hereby amended as follows: On and after January 1, 1905, the Illinois State Board of Health will accept as an equivalent of a part of the examination required satisfactory evidence of five or more years of reputable practice of medicine and surgery since graduation, and will allow a credit of 5 per cent. on the required average of seventy-five per cent. for each period of five years of such practice on the part of a candidate for a certificate.

Chicago Pediatric Society.—At the October meeting of this society summer diarrheas of children was the topic for discussion. Dr. A. C. Cotton presented a review of the recent literature on the subject, and, among other things, stated that dysentery had been known as far back as the fifth century. The characteristic lesions and repair had been described, showing that autopsies had been made. Endemic, epidemic, and sporadic dysentery had been reported. Almost nothing except the geographical distribution was added until the discovery of the *Amœba coli* or *dysenteriæ* in 1875 by Losch. In an epidemic in Japan, in 1898, in which there were 1,900,000 cases, and a mortality of 25 per cent., the Shiga bacillus was discovered by a Japanese physician. Discoveries followed in other countries. The 1903 report of the Rockefeller Institute for Medical Research in New York being the most available and comprehensive work on the subject just at present, the author extracted from it many points of interest.

Dr. George H. Weaver, bacteriologist of Rush Medical College, spoke on some bacteriological observations in connection with summer diarrhea. He presented charts showing results of cultural work. He said that in 102 cases taken from the sanitarium at Lincoln Park during the last summer 76 were negative and 27 yielded the dysentery bacillus. He touched on the history of the dysentery bacillus and the difficulties in the attempt to differentiate the organism. As the result of experiments, the tendency is now to group instead of individualize—for instance, one group has a certain action on dextrose only—another on lactose only, etc. Flexner founds his classification on the fermentation of dextrin; others have other bases of classification. There are two general groups, the acid or mannite, and the non-acid. Shiga is used as a broad term to cover all the non-acid group. In Constantinople a bacillus was isolated, which produced acid in milk and the characteristic dysentery lesions in cats, but seemed more like colon bacillus. Other investigators have found the characteristic lesion of dysentery caused by different organisms, so that the opinion now in general is that dysentery is a clinical picture and not an entity. Specific agglutination also is losing a good deal of its value. The Widal test has not so special a significance as it did have. The reaction is not specific in dysentery, either, as it gives the reaction fully as well in typhoid fever as in dysentery. Duval and Bassett record agglutination in 42 out of 53 cases of dysentery, and Wolfstein 39 out of 140, but the agglutination was not present until after the antidysenteric serum was administered. Flexner found it in the Rockefeller Institute in 270 out of 412 cases. Antidysenteric serum was used there, but it is not known whether it was used in all these cases. Dunn, in Rotch's clinic, found it in 10 out of 61 cases. They threw out all cases not agglutinated by the antidysenteric serum. If the dysenteric condition does not exist, it is wrong to use the serum. If not needed, it would be a disturbing element and might do harm. In

the 76 negative cases, 27,050 colonies were made. Of the 27 cases showing the dysentery bacillus, 17 gave the bacillus Y. This distinction has not been made in other reports. The true Shiga bacillus was not found at all. The organism produces different action on glucose, maltose and dextrose, and on different culture media, so that its isolation may depend upon conditions. The question is, Which are and which are not dysenteric bacilli? So unlimited numbers of cultures must be examined. Duval examined the milk stools of healthy babies, and found the dysentery bacillus in two cases, both culturally and by agglutination. In a large part of the cases of summer diarrhea, the dysentery bacillus was not found, or only in small numbers. Probably the ordinary cases of summer diarrhea are not due to the dysentery bacillus, but to various bacilli. Epidemics may be due to the dysentery bacillus. In the controls the agglutination occurred in a dilution of 1 to 400 sometimes, but usually in 1 to 200. Blood serum from scarlet fever and convalescing typhoid fever patients both agglutinated in the same dilution as blood serum from the dysentery patient, showing that dysentery is not a specific infection.

Dr. May Michael read a clinical report of the 102 cases examined by Dr. Weaver, giving the age, diet, character of stools, range of temperature, complications and termination of the cases. Mucus and blood were found in all but two of the cases in which the dysentery bacillus was found. The bacillus was not found in any case under six months of age, the largest number being between one and two years of age. The most of the cases were artificially fed. Four in the 27 cases in which the dysentery bacillus were found died, but recovery was the rule. Rickets, pneumonia, bronchitis, marasmus, whooping-cough were the most common complications, but many of the cases were in good physical condition at the outset of the diarrhea. The antidysenteric serum was used in one case, with no result.

Dr. John C. Cook reported 18 cases, in none of which was he able to isolate the dysentery bacillus, and none gave a clinical picture of dysentery. He found in cultures from the throat or stools one or more of the following organisms: Diplococcus, lactic acid pneumococcus, typhoid, sarcina, yeast, a short, thick bacillus, and a long, slender bacillus. The clinical symptoms were varied. There were complications of marasmus, brought on by improper feeding at home, and especially pneumonia. Five died, two of pneumonia, one of typhoid fever, in which the Widal test was positive. Antidysenteric serum was used in one case without result. One case recovered in which the organisms contained in its stool injected into a guinea pig caused its death. Two cases, one the typhoid fever case, and another reported by the nurse as having had two severe hemorrhages from the bowels, showed in culture a pigmenting organism staining the media a red color. The suggestion was advanced that the color in the stool might be due to the action of this organism on the mucus. The stool did not color water as blood does. The bacteriologists working for Dr. Cook, Mr. Gill and Mr. Bain, of Northwestern University Medical School, hoped to name this organism some day. One case that died at post-mortem showed bronchopneumonia, that could not by physical examination, pulse, temperature or respirations, be determined during life. Most of the deaths were due either to pneumonia or toxemia resulting from improper feeding.

Dr. William J. Butler reported ten cases from Cook County Hospital, in all of which the antidysenteric serum was used, without results in any case. All these cases had blood and mucus in the stools, but in only two was the dysentery bacillus found. Clinically, the cases varied, but the stool was usually green, the temperature high, and the pulse and respirations rapid. One case improved while using the serum, but the improvement was thought to be due to the use of calomel and whey rather than to serum. One case on milk and barley water diet showed no change in temperature, pulse or stool for five days under the serum treatment, but improved in every respect when diet was changed to albumin water.

GENERAL.

Another Yellow Fever Expedition.—The Liverpool School of Tropical Medicine intends shortly to send out a second yellow fever expedition to the Amazon, in view of the necessity of investigating still further a malady which continues to claim so many victims. It will be remembered that the late Dr. Walter Myers was selected by the school, together with Dr. Herbert Durham, to undertake an expedition to Para to investigate the fatal disease only a few years ago. Unfortunately, both members of the expedition were attacked by the malady and Dr. Myers succumbed. The expedition will probably start at the end of the year.

Medical Socialism.—The canton of Zürich has carried the activity of the State to a remarkable length. It has decided to levy an annual poll-tax of 86 cents, to be called the Zürich Medical Tax. It will produce $100,000 a year, sufficient to maintain forty or fifty qualified doctors; and in return for paying the tax any inhabitant will be entitled to call in one of these doctors at any moment to claim medical attendance free of charge all the year round. There is no great fear that the precendent will be followed in our own country, writes a correspondent of the *Pall Mall Gazette* of London, until the Zürich experiment has had plenty of time to be tried. The medical profession could, no doubt, be relied upon to oppose any such scheme. It is appalling to think of the burden that is likely to be thrown upon those unhappy forty or fifty Swiss doctors, if the people of Zürich are at all like our own. It is not only among rich people who have little else to do but to imagine themselves dying that panic-stricken desires for the doctor, on the occasion of the slightest ache or discomfort, are common; the domestic servant class are equally prone to this weakness. Unless the State doctors adopt a bearish repulsiveness of manner in self-defence, they will have work enough.

Japan Hospital Service.—The Army General Staff, writes the *Sun*, is to be commended for its decision to dispatch surgeons to the regular army to observe the operations of the field hospital service of the armies now engaged in Manchuria. The particular point open to criticism in this decision lies in the purpose to send only one representative to each army. It would be better to send two, or even more, with which we thoroughly agree. It is remarkable that within so short a time after the close of wars in which such nations as England and the the United States have been engaged, it should be possible for the War Department of this country to state officially "that it has become evident to the General Staff that there has been almost a revolution in field hospital methods as a result of the war as far as it has gone." "We are somewhat disposed to doubt whether this is an exact statement of the case. It seems far more probable, in the case of Japan at least, that the comparative freedom of Japanese camps and moving armies from those epidemics which are the usual attendants of military bodies, and the success of field

surgery in the treatment of wounded men, is due far more to Japanese prevision and preparation than to lessons learned since the outbreak of hostilities. While the treatment of wounds in field hospitals is of unquestionable importance, it is of far less importance than is the prevention and cure of diseases in camp. This is established by the fact that from April until September 30, 1898, the records of the United States Army show 345 deaths in action or from wounds received in action and 2,565 deaths from causes other than bullets or cannon balls. Japan's record in Manchuria is so remarkably unlike this that we shall do exceedingly well to study her methods with great care and give them effect in our own service. The dangers most to be dreaded in war are not those of the battlefield, but those of the camp. If we can learn from Japan, by all means let us take a leaf from her book."

Fourth Pan-American Medical Congress.—The Fourth Pan-American Medical Congress, which will convene in Panama the first week in January next, bids fair to be a most delightful mid-winter trip. The delegates will leave this country by the Atlantic, Pacific and Gulf coasts the last week in December. They will return by the same routes, or will make round trips. The Public Health Association meeting will take place on the following week in Havana, and those desirous of attending both meetings can arrange to do so. There are two routes for the physicians to take from Panama to Havana. The first is by way of Jamaica to Santiago de Cuba by boat and overland by rail to Havana. The second is by water from Panama to Vera Cruz and from there to Havana. The former will probably be the most pleasant trip. From Havana, the return trip can be made directly north to New York by water or via Miami or Tampa, Florida; or New Orleans. The connections and dates of sailing are now being arranged. The Panamanian Government has appropriated $25,000 for the Scientific Session and the entertainment. The Congress will be held from the second to the sixth of January. The afternoons will be devoted to the Scientific Sessions and the mornings and evenings to trips and social functions. So far as can be learned, the programme in Panama will be a reception on the first day, by President Amador of the Panama Republic, and the formal opening session of the Congress the same evening. On the second day, an excursion to the Canal in the morning, meeting of the various sections in the afternoon, and a banquet in the evening; on the third day, an excursion down the bay to Taboga Island, where a Panama breakfast will be served, scientific sessions in the afternoon and a ball in the evening. On the fourth day, an excursion to the U. S. Army barracks in the morning, section meetings in the afternoon and the formal closing session in the evening. On the fifth day, an excursion to the plantation of the United Fruit Company; and in the afternoon of this day, those of the congressists who intend going to Cuba to attend the meeting of the Public Health Association, will sail for Jamaica, while those who intend going by way of Vera Cruz, or returning home by way of New Orleans or New York, will remain until the following Tuesday. The Secretaries of the Sections of the Congress for the United States are: Doctors A. H. Doty, of New York, Hygiene and Quarantine; Judson Daland, of Philadelphia, Medicine; R. Matas, of New Orleans, La., General Surgery; Bert Ellis, of Los Angeles, Cal., Eye; Hudson Makuen, of Philadelphia, Throat; Frederick Jack, of Boston, Mass., Ear; C. H. Hughes, of St. Louis, Mo., Nervous Diseases; Geo. Goodfellow, of San Francisco, Military Surgery; John Ridlon, of Chicago, Orthopedic Surgery; D. W. Montgomery, of San Francisco, Dermatology; C. G. Kerley, of New York, Pediatrics; Noble P. Barnes, of Washington, D. C., Therapeutics; Walter Chase, of Boston, Pathology. Communications form physicians in the United Staes interested in these branches, can be sent directly to these different Secretaries. Delegates intending to attend the Congress, desirous of obtaining information concerning it, should communicate with the Secretary of the International Executive Committee in the United States, Dr. Ramon Guiteras, 75 West Fifty-fifth Street, New York.

Illinois County Regulations.—The following information will undoubtedly be of interest to every member of the medical profession in Illinois. It will certainly be of great value to those who assume the care of indigent patients. Under the law of Illinois, a liability is imposed upon counties to give or cause to be given such assistance as may be necessary to persons falling sick within the county, who are without money or property to pay for such assistance—in short, a county is liable for the necessary expense of medical attendance, nursing, provisions, fuel, etc., of a patient who is unable to provide for himself. It must be remembered, however, that a county is not liable for services rendered by a physician to an indigent patient—except in case of emergency where prompt and immediate action is required—or for supplies furnished to such patient by a physician or any other person, or a municipality, unless express authority to render service or furnish supplies has been given by an authorized county official, the Overseer of the Poor in Alexander, Calhoun, Cass, Edwards, Hardin, Henderson, Johnson, Massac, Menard, Monroe, Morgan, Perry, Polk, Pulaski, Randolph, Scott, Union, Wabash and Williamson counties, or the Supervisor or Overseer of the Poor in other counties, unless, perchance, the authorized county official should neglect or refuse to give or cause to be given to the patient such assistance as may be necessary, after the necessity therefor has been brought to his attention. It seems necessary to lay special stress upon these points, as, during the last few years, physicians have undertaken the care of smallpox patients without authority from the county and have sought in vain for the payment for their services. A few of these physicians had received authority from city and village officials to care for the patients in question. Since the municipal officials had not consulted the county officers in these cases, the county was not liable for the services rendered, and it is very questionable whether action against the city or village would hold. Another point which may be of great importance to the physician who undertakes to "look after" smallpox patients: The expense of enforcing health laws and quarantine regulations always falls upon the city, village or township concerned, and not on the county. In counties not under township organization, the expense falls upon the county in territory outside incorporated cities and villages. A township is not liable for expenses incurred within the corporate limits of a city or village, nor is the city responsible for expenses incurred within the township outside of the corporate limits of the city or village. An additional point which may also be of importance: A county is not liable for the expense of the care,

medical attention and supplies of a patient quarantined in his home, who has sufficient means to procure such care for himself. If a physician attends such a patient, he must look to him for payment for his services.

The Death-rate from Cancer and Appendicitis.—Dr. Tatham, in an analysis of the causes of death in the report of the Registrar-General for 1902, just issued, states that for England and Wales tuberculosis caused 57,396 deaths or 10.5 per cent. of the mortality from all causes; while alcoholism or delirium tremens caused 2,784 deaths. The deaths ascribed to cancer or malignant disease in the year under notice numbered 27,872, and exceeded by 2,384 the average number in the previous ten years corrected for increase of population. Of the above-mentioned deaths 13,540 were attributed to carcinoma, 1,690 to sarcoma, and 12,642 to "cancer" or "malignant disease" simply. Among males the crude rate of cancer mortality was 696 per million living, and was the highest male rate on record; among the other sex it was 985 per million, which had been the rate prevailing in the previous year likewise; this rate also was the highest on record among females. The mortality from malignant disease does not bulk largely in the bills of mortality until somewhere about the thirty-fifth year of life. It is right to mention, however, that at each of the six age-groups of the period under thirty-five years, the registered mortality from malignant disease is also increasing, and that not slowly. After giving a table showing the cancer death rates at all ages above thirty-five years—in England and Wales as a whole, in the urban counties, and in the rural counties—the rates in 1902 being compared with the average rates in the five years immediately preceding, he points out that if the cancer mortality at ages above thirty-five years he judged by the crude death rates the rural counties will appear to suffer much more heavily than the urban, whereas, if the corrected death rates be taken as test, the opposite conclusion follows, for the rural cancer mortality in both sexes is shown to be considerably the lower. But even this adjustment fails to reveal the true relative mortality in populations thus differently circumstanced. Appendicitis was the certified cause of the deaths of 901 males and 584 females—together 1,485, persons, in the year 1902, as compared with 1,244 in the year immediately preceding. Among males the death rate from this disease was equal to 56 per million living and among females to 34 per million, the rates in the previous year having been 47 and 30 per million respectively. Appendicitis was abstracted as a separate cause of death for the first time in 1901, previous to which year the deaths certified as from this cause were classed under the head of enteritis. There is little doubt that in past years many of the deaths registered as from peritonitis were really due to appendicitis. In compiling the tables for the year under present notice 154 deaths were contributed to the total of 1,485 deaths from this disease, as a result of medical inquiry, these 154 deaths having originally certified as from peritonitis.

OBITUARY.

Dr. WILLIAM WILSON, of Jersey City, N. J., died on Wednesday, Oct. 26, in his seventy-fifth year.

Dr. ELEANOR LOUISE RUNDIO, South Orange, N. J., died on Monday night at her home, of typhoid fever. She studied medicine in the New York Medical Hospital and College for Women, and graduated from there in 1902, after which she served as a resident physician for one year. She then went to the Lying-in Hospital, New York, and later took a course in the New York Ophthalmic Hospital.

Dr. MORDECAI PRICE, one of the best known surgeons in Philadelphia, was found dead in his office October 29. The evening before he was in his usual health and performed an operation for appendicitis. He was found the next morning lying on the floor grasping his instruments, evidently dying shortly after reaching his office. Dr. Price was sixty years old. His preliminary education was obtained in New York, and he graduated in medicine at the University of Pennsylvania in 1869. For a number of years he has been associated with his brother, Dr. Joseph Price, in their private hospital on Eighteenth street.

Dr. LEWIS ROYER, of Pottstown, Pa., died of apoplexy October 26, aged eighty-two years. He had been engaged largely in the wholesale drug trade and in other busines affairs.

Dr. DAVIS G. HETZELL died in West Philadelphia, where he had practised more than forty years, on October 25, aged sixty-eight years. He was graduted from Jefferson Medical College in 1861 and served as surgeon in the Civil War.

CORRESPONDENCE.

OUR LONDON LETTER.

(From Our Special Correspondent.)

LONDON, October 22.

AN X-RAY SCARE—THE PROPAGATION OF DEGENERACY—AN EPILEPTIC COLONY—THE PREVENTION OF CRUELTY TO CHILDREN—THE LATE DR. NIELS FINSEN.

IN a previous letter reference was made to the sad case of Dr. Blacker, radiographer to St. Thomas' Hospital, who died of a spreading epithelioma of the arm originating, it was believed, in a burn of the finger caused by X-rays. The case was made the more tragic by the fact that Dr. Blacker successfully treated King Edward VII. for a small rodent ulcer of the face while he was himself actually in the clutches of a more terrible disease. The case was kept so secret here that few people know the facts. Recently, however, carefully veiled allusions to it have appeared in some newspapers in connection with sensational reports as to the prevalence of X-ray dermatitis among radiographers. These reports had their origin in a paper read by Dr. Hall-Edwards of the General Hospital, Birmingham, at the annual meeting of the British Medical Association held at Oxford in July. He there gave an account of the condition of his own hands which are covered with warty growths, cracks and ulcers that have resisted all treatment. The warts grow steadily and can be kept down only by rubbing with sandpaper or cutting with a razor. Great pain is experienced, and altogether the outlook is unpromising. Dr. Hall-Edwards states that several medical men have abandoned the use of the X-rays, in consequence of similar mishaps, and in a case of which he has personal knowledge, eighteen months' rest, with constant treatment, has produced but slight improvement. It is not only the hands that suffer. Several constant workers suffer from chronic dermatitis of the feet, which the boots have failed to protect. Dr. Hall-Edwards' paper, appearing as it did almost simultaneously with the news of the death of Edison's assistant, Clarence M. Dally, has, of course, been seized upon by the sensational press which sees in all this the opportunity of a "scare,"

that will fill their columns at this dull season. The flesh of the public is made to creep day after day with headlines, such as "Terrors of the X-Ray," "The X-Ray Peril," "A New and Painful Disease," "London Doctors' Terrible Sufferings," etc. It is stated that nearly all the doctors who are engaged in X-ray work in the London hospitals are suffering from dermatitis. Quite recently, we are told, one doctor, who is in charge of the X-ray department at one of the largest of the London hospitals, had the first two joints of the forefinger of his right hand amputated, and a few days ago it was found necessary to take the remainder of the finger away. To an interviewer the doctor confided tnat he had suffered the torments of the damned. From June onward, until he had his finger amputated he scarcely knew what sleep was. Night after night he rolled about in agony. "All the earlier workers," proceeded the doctor, "are suffering in greater or less degree; and this is due solely to the fact that we did not know what we were working with, and took no precautionary methods against possible danger." It is certain that X-ray dermatitis more or less severe is fairly common among operators; experience here agrees with what is reported from America. But the newspapers, as is their wont, have exaggerated both the actual mischief and the danger. Doctors engaged in X-ray work have learned the necessity of taking proper precautions, and there one hears but little of dermatitis among the younger men.

It is estimated that there are 50,000 epileptic children in the United Kingdom, and that one child in every 100 of population is feeble-minded. During the last few years special schools have been established in which such children are trained till they are sixteen. Then they are thrown on the world where they are left to shift for themselves. Most of them drift into imbecility, vice and crime, and flood the workhouses and prisons. They are thus a grievous burden to the community. By way of remedy it has been suggested that some public authority should be empowered to detain feeble-minded persons incapable of looking after themselves and place them in what may be called colonies of refuge, where they will be safe from temptation and where in particular they will not be allowed to propagate degeneracy. A conference of representatives of the National Association for the Feeble-Minded and the National Union of Special Schools was held on October 13 and 14, to discuss the steps to be taken to give effect to this proposal. A striking instance of the danger of allowing mentally defective children to be at large was given by Mrs. Burgwin, a lady who has taken a leading part in organizing special schools for such children in London. She said she knew in one district a family of seven children of whom three were physically defective, two mentally defective, one very bright and promising, and one apparently all right. The latter was a little boy, very alert, ready and fluent in expression. But his school teacher knew him to be mean and cunning. In the playground he was always pinching smaller children. It was impossible, however, to get him certified for detention, and one day the bright child of the family, aged four, was found drowned, and they felt morally certain that the cunning child had drowned her. But there was no proof, and he was set free. Every one sympathized with him. Two months later he took another child into an empty house, and, but for a passer-by, would have undoubtedly killed him. The boy is now confined as a criminal lunatic, but he ought, said Mrs. Burgwin, to be taken charge of as a mentally defective child. Feeble-minded children may, according to her, be divided into three classes: (1) Those who, after training, can return to elementary schools. (2) Those who remain in the special schools until sixteen. (3) Those who after trial are found to be non-educable. She urged that the third class should be certified and sent to permanent working colonies, but on no account allowed to be at liberty. If they were, the result would be that the public would have to keep not only them but their progeny. Terrible facts with regard to feeble-minded and defective women were given by Dr. Potts, of Birmingham. He paid a visit to a girls' night shelter, and investigated the first twelve cases he found there. The following is the record: 1. Consumptive, both parents died of the disease. 2. Neurotic drunkard, with a family who had suffered from St. Vitus' dance. 3. Normal. 4. Deaf and mentally defective. 5. Neurotic and mentally defective. 6. No congenital defect, but health ruined by drink. 7 and 8. Feeble character. 9. Suffering from persistent bad memory. 10. Twice imprisoned for theft; daughter of drunken loafer. 11. Normal. 12. Mentally defective and suffering from heart disease. Thus, out of twelve only two were normal individuals. Yet the ten were free to go as they liked, and to bring up defective children. "It is well known," said Dr. Potts, "that a large number of the inmates of penitentiaries are feeble-minded women." The cost of keeping such persons in colonies would be high, but small compared with the ultimate cost of keeping them and their progeny. In Birmingham he knew a feeble-minded woman selling matches who had nine times been in the maternity wards of the workhouse. Surely that was a disgrace to our legislation. The Magdalene homes, said Dr. Potts, are filled with girls in their teens, and out of ninety-seven cases he investigated he found 37 per cent. were mentally deficient. Yet there was no power to keep them out of the streets. The causes of mental defects Dr. Potts gave as: 1. Defective nutrition in early years of life. 2. Hereditary tendency to consumption. 3. Descent from insane or criminal stock. 4. Chronic alcoholism of one or both parents. "Is there any one who has inquired into the family history of inmates of prisons or reformatories who thinks," asked Dr. Potts, "that so long as the expenditure on drink in this country reaches the appalling total of £180,000,000 per annum, we shall free ourselves of this terrible incubus of criminals, epileptics, lunatics, neurotics, feeble-minded and defective persons?" A resolution was passed advocating that the optional law giving education authorities the power to open special schools for defective children should be made compulsory. Sir Robert Anderson, who, as a high police official, has had a large experience of defectives, complained that there was a false idea of liberty abroad with regard to such persons. "So long," he said, "as they keep their hands off our throats and out of our pockets, it is held that they ought to be at liberty to do as they like. That is a mistake. I would define liberty as 'the divine right of every man to do what he ought to do.'" "Why," he said, "does nature eliminate the unfit? To protect the community. Therefore, if we prevent the elimination of the unfit by training them we ought to protect not only them, but the community, by looking after them. To accord to the feeble-minded

all the rights of the citizen is the part of quasi-philanthropic lunacy. Is it not monstrous that there should be no restriction of the marriage of these feeble-minded people? The sham philanthropists have expended all their little stock of pity upon these poor objects, but they have no pity upon those they bring into the world. I have been represented as one of the most hard-hearted members of the community, but I say emphatically, our duty is to protect these feeble-minded people from themselves." Sir Robert Anderson went on to urge that the care of the feeble-minded should be raised into a national question, and that public opinion should be educated to accept a national scheme for the detention of such persons. A resolution in that sense was passed unanimously.

A good example of what can be done for the care of epileptics is afforded by the colony founded and maintained by the National Society for the Employment of Epileptics at the village of Chalfont St. Peter, in the county of Buckingham. In the homes there established some 200 epileptics enjoy the advantages of a regular life passed in healthy surroundings. Since the establishment of the colony in 1894 several homes have been added, but the accommodation has always been inadequate to meet the ever-increasing applications for admission. During the last year an administration house has been built at a cost of $25,000, contributed by a well-known philanthropist, Mr. Passmore Edwards. The new buildings were formally opened on October 20. Among those present were the King's physician, Sir William Broadbent, and Dr. Thomas Buzzard, the distinguished neurologist. Lord Rothschild paid a well-deserved tribute to the excellence of the work done by the National Society for the Employment of Epileptics.

On October 1 there came into operation a new act for the prevention of Cruelty to Children. Among the novel points in the act is a provision that any person having the custody of a child under sixteen years of age, who shall wilfully ill-treat, neglect, abandon, or expose such child in a manner likely to cause unnecessary suffering or injury to its health, shall be liable, on conviction, to a fine not exceeding $2,500, or imprisonment with hard labor up to two years. Further it is enacted that upon the trial of any person for the manslaughter of a child of which he has had the custody, the jury may find the person guilty of "an offence of cruelty." Further, if it is proved that a person indicted for an "offence of cruelty" is interested in money payable in the event of the child's death, and had knowledge that such money would thus become payable, the fine may be doubled and the alternative punishment increased to five years' penal servitude. It is forbidden, save in certain exceptional cases, to cause any child to be in any street or premises for the purpose of begging, or in any premises licensed to sell intoxicants for the purpose of singing, playing, performing, or selling between 9 P.M. and 6 A.M. Moreover, no person may cause any child under sixteen to be in any place for the purpose of being trained as an acrobat, contortionist, or circus performer, or for any other dangerous performance. In the 1896 act, this prohibition did not extend to parents who themselves trained the child. This exemption no longer exists.

Mr. Malcolm Morris, the real pioneer of the light treatment in this country, has been asked by the committee formed in Denmark for the erection of a monument to the memory of Niels Finsen, to cooperate with them by heading a British committee for the same purpose. Although there is much difference of opinion among physicians here as to the value of the light treatment, the movement will probably find considerable support, as it is sure to have the approval of the Queen, who is known to be a great admirer of her deceased countryman. Our people are in regard to royalty like the virgins who follow the lamb withersoever he goeth. Finsen, however, though he can scarcely be called a great man, deserves a monument for his devotion to work under the most discouraging circumstances.

URGENT ADENECTOMY.

To the Editor of the MEDICAL NEWS:

DEAR SIR: In the issue of the MEDICAL NEWS, October 15, 1904, Dr. H. Jarecki reports a case of urgent adenectomy during the progress of a pneumonia. Though the operator is to be congratulated upon his success, the method employed is extremely radical and open to a serious objection.

It must be conceded, and the point is appreciated by the author in the article referred to, that the removal of adenoids during the course of an inflammatory process in the bronchi or lungs is a hazardous procedure in any case, especially in an infant. Particularly so in view of the fact, that the object to be attained, viz., to give the patient nasal breathing, can be secured by a simpler and less dangerous method, one that can be employed by the attending physician.

Under ordinary circumstances, a moderate degree of obstruction due to adenoids can be relieved by instilling a mild warm alkaline solution into the anterior nose, or the normal salt solution may be used. A few drops of warm castor oil, vaseline or alboline will answer the same purpose.

Pneumonia is a frequent occurrence in infants and children with adenoids. The simple suggestions just offered, have been used with good results in numerous cases.

If the obstruction, however, is of a high grade, as was the case in Dr. Jarecki's patient, the plan referred to below may be tried.

Some years ago Dr. Goodwillie advocated the use of hard rubber tubes (nasal intubation) to relieve nasal obstruction. Others have modified the tubes, or rather, in their place, have advised and used drainage tubing of the proper length and caliber. A portion of a soft rubber catheter (Jacques or Nelaton) will answer as well, and is preferable as its surface is better finished. Properly lubricated, it can be easily passed along the flow of the nasal passages, as in nasal feeding, until the posterior pharynx is reached, the portion at the anterior nares is secured by means of a small safety pin, and the rest cut off. It may be done on one or both sides, or a tube may be kept in for a short time in one nostril and then changed to the other. It is surpising how readily relief is afforded. It may not be necessary to keep the tube *in situ* more than a few hours. Sometimes it can be used for days, taken out morning and evening to be cleaned. The recommendations are not theoretical. The writer has resorted to the plan (introducing catheter) in infants with lateral pharyngeal abscess and adenitis of Henle's glands, also in cases of infectious diseases complicated with nasopharyngeal exudation of false membrane and secondary cervical adenitis, etc. The method is simple,

it does not deserve to be termed an operation, is without danger, can be employed by the physician or trained nurse, and secures prompt relief. Furthermore, there is no large raw surface left, which (in an infant or young child whose vital powers have been lowered by the pneumonia poison) might easily permit the entrance of pathogenic germs and give rise to serious septic symptoms.

In the above remarks there is no intention to cast any reflection upon the management of the case. The operation was a brilliant success, moreover, the patient recovered. The object of this communication is merely to direct attention to a simple procedure, whereby a fair amount of nasal breathing can be secured without any dangerous operative measure. Of course it is understood, in such patients, the nasopharynx ought to be cleaned out subsequently. Such an experience as the one detailed above is a strong argument in favor of an early removal of lymphoid hypertrophies giving rise to obstructive symptoms. The operation should be done before the advent of dangerous catarrhal symptoms involving the bronchi or lungs. F. HUBER, M.D.

October 18, 1904.

SOCIETY PROCEEDINGS.

NEW YORK STATE MEDICAL ASSOCIATION.

Twenty-first Annual Meeting, held at the Academy of Medicine, New York City, October 17, 18, 19 and 20, 1904.

THIRD DAY—WEDNESDAY, OCTOBER 19.

(Continued from Page 861.)

Original Dose of Antitoxin.—Dr. L. C. Ager, of Brooklyn, presented a sample of the original dose of antitoxin, as it was sent to this country when the serum was first introduced. The dose was about one-half of one c.c., and as the serum was very low in antitoxic quality, it can readily be understood how weak the remedy was. Now it is understood that the dose should be large. The American Pediatric Society decided some time ago that 2,000 units should be the beginning dose. This was a mistake. Dr. Ager thinks that at least 3,000 units should be used and many of the failures that are blamed on antitoxin are really due to too timorous use of the remedy. Dr. Ager considered that the only prejudice against antitoxin is with regard to its supposed liability to produce paralysis. This is due to some wild newspaper statements, and is unsupported by any evidence. He is glad to notice that Dr. Kerley advises the injection of the serum into the abdominal wall. The Health Department suggests its injection into the soft tissues of the back. This is almost sure to invite discomfort, at least, and may be the source of even suppurative condition with the child lying on its back. Personally he considers that injections into the mammary region in children are best, because there is least likelihood of sequelæ.

Infrequency of Intubation.—Dr. Francis Quinlan, of New York, said that before the introduction of antitoxin, he had to do many intubations, and tracheotomies. In one year he did 116 intubations. Now the necessity for this is very rare. The entire use of antitoxin did away with the necessity for the practice. Antitoxin is a physiological remedy that exactly meets the indication. It is the only one in the whole range of medicine. It seems too bad that there should be any opposition to it, yet there still remain some physicians who do not favor its use.

Appearance of Membrane.—Dr. Louis Fischer, of New York, said that a large dose of antitoxin should be given at once when the disease was recognized, and then the appearance of the membrane, together with the temperature and pulse, must be the guide to repetitions of the remedy. Not less than 5,000 to 10,000 units should be given as an initial dose. This is the custom at the Willard Parker Hospital. It should be given until its effect is produced. As soon as the membrane assumes a granular appearance and begins to disintegrate, the victory has been won. Nasal diphtheria is quite as bad as laryngeal diphtheria, and the initial dose should be at least 10,000 units repeated if necessary. Antitoxin must not be relied on alone, however, but the children must be fed freely so as to improve their nutrition and increase their resistive power. The antitoxin does not kill the Klebs-Löffler bacillus and has no effect on it. The resistive vitality of the tissues must be aroused to oppose further invasion. The bowels should be stimulated and the kidneys and the other emunctories, and the little patient should be kept in perfectly fresh air, as far as possible.

Opposition to Antitoxin.—Dr. Jas. J. Walsh, of New York, said that a certain amount of opposition to antitoxin still existed in spite of all that had been accomplished. It is found much more among the educated classes, especially newspaper men and literary workers. It is evidently due to the fact that the antis know how to get into print with their effusions. The antivivisectionists are also as a rule rabidly opposed to the use of serum therapy, because they fear the torture of the animals in its preparation. They discredit all the favorable reports and in their journals in this country and England keep repeating the story of any deaths that have taken place during the use of antitoxin and attribute all postdiphtheric palsy and nephritis to its use. By realizing the exact location of opposition more can be accomplished in meeting it. The antivivisectionist crusade against antitoxin is doing more to hurt their cause than anything else because mothers learn the value of it after use in the family and the philanthropically inclined see its benefits in hospitals. These points should be insisted on by family physicians who are interested in the progress of serum therapy and the defeat of the antivivisectionist movement as regards its extreme features.

Spraying the Throat.—Dr. Kerley said, in closing the discussion, that free spraying of the throat with diluted hydrogen peroxide seemed to be the best method of getting rid of the bacilli, which remained after the clinical symptoms of diphtheria had disappeared. During the progress of the disease, such spraying does not seem to be of special benefit, but in a convalescent period it should always be employed. To his mind the important principle with regard to the use of the antitoxin, is that not the diphtheria in general must be treated, but the individual patient and the conditions that are found in the individual case. The tendency should rather be toward large than small doses.

Radical Cure of Hernia in Children.—Dr. William B. Coley, of New York, reported the results obtained by Dr. William T. Bull and himself in 1,400 operations for the radical cure of hernia in children, performed at the New York Hospital for Ruptured and Crippled from 1891 to 1904, altogether 49,000 cases of hernia were under observation. Of these 47,000 were inguinal hernia. 4,000 cases of hernia oc-

curred in patients under fifteen years of age. Of these about 1,400 were operated. The others were treated by means of trusses and other means. Most of the cases operated on were very large hernias in whom trusses had been tried and failed or in whom there was a frequent tendency for the hernia to descend in spite of the truss. As a rule trusses were worn for one to two years before the operation was done.

Age for Hernia Operation.—Under four years of age, the radical cure of hernia by operation does not seem advisable. Young children frequently are cured of their hernia by the use of a truss or by other simple means. After this age, the use of the operation becomes more and more advisable, especially in the dispensary service, where proper care cannot be taken of such cases at home. One thing seems of special interest, viz., that there are many relapses after the cure of hernia by means of truss. In adults it is not an infrequent story that they suffered from hernia as children, which was cured, and then later on the relapse. Some surgeons advise operation even in infants, but the truss is better. Congenital hernia is probably never cured by means of the truss. In cases operated by the Bassini method not a single relapse has occurred, though the cases have been traced for from two to eight years. In inguinal hernia in female children, the round ligament is sometimes allowed to remain in its usual location, yet the absence of relapses shows that the cord transplantation, considered so important in the male, is not always absolutely essential. Of course, the cord in children is smaller than in adults, and the round ligament is usually very small, so that this has its influence. In adults it seems advisable always to follow the Bassini method completely. None of the veins of the cord are ever excised. The lessening of the diameter of the cord may be necessary in the Halstead method of radical cure, but not in the Bassini. At times the excision of the vein is followed by atrophy of the testicle, an extremely undesirable sequela. The tissues are brought together by means of kangaroo tendon, as introduced by Dr. Marcy, of Boston. This keeps the tissues firmly together until union takes place, and then is well absorbed. Whenever the appendix is found to be adherent to the sac, it is removed. It is never specially looked for, however. Some relapses took place in cases of sliding cecal hernia in which there was no proper neck of the sac to tie. Four deaths took place in 1,460 cases. In the first double pneumonia carried off the patient on the fourth day. In the second at autopsy, a septic condition was found after a long and serious operation requiring considerable handling of tissues in the days before the introduction of rubber gloves. In the third cases there was very serious complicating Pott's disease, and the patient died of acute pericarditis on the eighth day. This case would not now be considered suitable for operation. The fourth death took place after an operation performed by an assistant surgeon who was not so familiar with the technic of the radical operation, and the operation took more than an hour and a half. This delay gave occasion for air infection, while the bruising of the tissues during the lengthy manipulations reduced the resistive vitality.

Suture Material.—Undoubtedly the kangaroo tendon is the best. The asepticity of ligatures used to be considered the only quality worth thinking of. As McEwen remarked at the last meeting of the British Medical Association, this is only one of the qualities of ligatures, and not the most important. The ligature material must hold long enough to bring about union of tissues and then should be rapidly eliminated. Wire sutures are eminently inadvisable. In some cases where they have been used, subsequent strangulation has been found to occur in a loop of th wire. In the 1,460 cases operated upon, there were six relapses. Four out of the five of these occurred in patients in whom the cord had not been transplanted. They were done before the day of the Bassini operation. In the sixth failure, the case was one of sliding hernia. Most of the relapses take place during the first six months. Ninety per cent. of them during the first year, which is also the experience of other operators. In 600 cases, operated upon in patients between the ages of one and twelve years, there has been no relapse.

Dr. Wiggins said that kangaroo tendon is undoubtedly a most valuable suture material. He has recently had a severe test case in which to try it. A woman who was three and a half months pregnant had to have a laparotomy performed. The pregnancy was not interrupted and the avoidance of a hernia seemed almost impossible. Kangaroo tendon was employed, however, for the suture material, and the wound healed in excellent shape, and the pregnancy went on to its full term without any complications and without any sign of yielding on the part of the abdominal scar.

Dr. De Garmo said that in his experience radical cures for hernia in children had better be delayed until the patients are over four years of age. He has done 1,162 operations, 220 of them in children, and has had no relapses in children. In children undoubtedly hernia can sometimes be cured by means of the truss. In hernia in male adults, it is sometimes advisable to remove some of the vein so as to make the cord of less size.

Dr. Coley said, in closing the discussion, that after the truss has been given a fair trial, operation for the radical cure of hernia should not be delayed too long. Congenital hernias are apparently not cured by the use of the truss. In those that are cured, relapses sometimes take place, certainly much more readily than after radical operation. It is better then to operate as soon as it is decided that the truss will not prove curative.

Infant Mortality in New York City.—Dr. Lewis C. Ager, of Brooklyn, discussed the infant mortality statistics of Greater New York, remarking, as an introduction, that while figures cannot lie, lies can and do figure in statistics on many occasions. Of the 21,000 deaths in New York City during the past year, over one-fifth were in persons under one year of age, and nearly one-third were under five years of age. Most of the deaths among young children were from diarrhea, and the majority of them took place during July and August. While the general death rate has been constantly increasing, the mortality rate has not always corresponded to this increase among children. In 1902 there were 3,200 deaths; in 1903, 2,755 deaths, while in the summer just past, there were 3,800 deaths. The improvement that has come in the death rate must be attributed to the inspection of tenement houses and the milk supply and to the work of the Milk Commission. The best work can be done in educating the people to a knowledge of the important factors in infant healing.

Comparative Infant Mortality, Brooklyn and New York.—Up to 1891, the mortality rate favored Brooklyn. Since that time it has been against Brooklyn, and more deaths have taken place in proportion to the population than in Manhattan. What seems a curious paradox is to be found in the statistics of deaths from diarrheal diseases in the component parts of Greater New York. During the period when 170 deaths were reported in New York County, there were 209 in Kings

County, 216 in Queens County and 228 in Richmond County. This is exactly the opposite of what would be expected since overcrowding of population is supposed to be a factor in diarrheal diseases. The infant mortality in Brooklyn is worse than in New York, and this is due to the fact that condensed milk is used much more frequently in Brooklyn than in New York. In 250 infants deaths carefully traced in Brooklyn, about 60 per cent. of the little patients had been fed on condensed milk. Among the same number in Manhattan only 27 per cent. were fed in this way. Children fed on condensed milk, even when not actually ill, lose their resistive vitality. Another factor in the increased infant mortality in Brooklyn lies in the circumstance that here is practicaly no disposition of free ice among the poorer classes across the river and philanthropy has done very little to supply them with Pasteurized or otherwise sterilized milk.

Prostatectomy in Emergency.—Dr. John F. Erdmann, of New York, said that in all emergency drainage of the bladder in old patients, he preferred to do a prostatectomy and drain through the perineum. Formerly such drainage was apt to be suprapubic, and there were many accidents that might take place. Such drainage is contra-indicative only in extensive malignant disease of the prostate with great enlargement. The dangers of the perineal operation are not near so great as the suprapubic method. There is never the profound sepsis that occurs by the former method. Patients do not have to lie down, but may sit up not long after the operation, and may even walk about on the fifth day. The pressure while sitting up brings the edges of the operation wound together and aids recovery.

Dr. R. H. M. Dawbarn, in discussing Dr. Erdmann's paper, said that emergency prostatectomy with drainage through the perineum was a very valuable surgical procedure. It has a better technic than the older method and gets directly at the condition. The after-results are uniformly better.

Oxygen and Chloroform in Anesthesia.—Dr. James Taylor Gwathmey, of New York, discussed the value of oxygen in combination with the different anesthetics in common use. In his recent experience oxygen with chloroform has given specially good results, so much so that he considers it deserving of special investigation by a commiteee. He was enthusiastic as regards its freedom from danger, from complications and inconveniences of all kinds. At his suggestion, it was directed that the president appoint a committee to investigate further this imporant subject.

The Heart in Scarlet Fever.—Dr. Louis Fischer, of New York, read a paper on scarlet fever with remarks on the temperature as a guide in estimating the prognosis and the development of complications. He said that while the temperature is usually considered an infallible sign of the patient's condition in scarlet fever, it cannot always be depended on. Malignant scarlet fever may occur with apparently no temperature. Mild scarlatina with a temperature of 103° to 104° F. is not unusual. Very high temperature is not absolutely unfavorable. Fever alone is not the indication of the disease. The same thing is true in other children's affections. Dr. Fischer has seen empyema with a normal temperature. Other suppurative conditions may exist for days without causing serious disturbance of the temperature current. Hence the inadvisability of depending absolutely on the temperature. At times the toxins of the disease seem to inhibit the thermic centers, and there is very little disturbance of temperature.

MISSISSIPPI VALLEY MEDICAL ASSOCIATION.

Thirtieth Annual Meeting, held at Cincinnati, Ohio, October 11, 12 and 13, 1904.

(Continued from Page 864.)

The Mamma: Its Physiological Purposes.—Dr. Thomas H. Manley, of New York, discussed the coarse and finer anatomical elements of the mamma in their bearing on some of its pathological affections. He drew the following conclusions: (1) The mamma is a highly organized and structurally a most complex organ. (2) Its functions are manifold. It is an essential and integral part of the generative system. Intermittent in function, like the testes, total ablation, like double castration, makes its impress on the sensorium. (3) Very frequently degenerative or pathological changes begin in a single isolated lobe, about twenty of which are in each breast. In all non-malignant affections, radical measures should be limited as far as possible to the affected area or lobe. (4) It is only in malignant disease of a progressive type and life is imperiled that total sacrifice of the breast is justifiable. (5) Inasmuch as the functions and purposes of the axillary lymph ganglia are yet imperfectly understood, and their removal, quite invariably enhances the risks of operation involves a wide mutilation of the chest walls, and always leaves more or less impediment in shoulder action, or even at times a painful tumefied limb, it is only as an extreme and exceptional measure that their complete extirpation should be practised.

Intestinal Surgery, with Remarks on Technic.—Dr. John Young Brown, of St. Louis, said there was a class of abdominal cases which might justly be considered acute, for the reason that the indications for immediate surgery were mandatory, and in which the mortality largely depended upon the time of operation and the technic of the work. He discussed, first, penetrating gunshot and stab wounds of the abdomen; second, severe abdominal contusions associated with rupture of intestines or other visceral injuries; third, strangulated hernia, confining himself as nearly as possible to a consideration of the operative technic, citing cases in point.

Gastro-enterostomy.—Dr. William H. Wathen, of Louisville, Ky., in this paper described all the pathological conditions indicating the necessity for stomach drainage by the several methods that had been practised for this purpose. He said pyloric divulsion had proven unsatisfactory, seldom gave permanent results, and sometimes committed a traumatism that increased the trouble. Pyloroplasty and its modifications had given better results, but the operation was seldom indicated and was practically obsolete. Gastroduodenostomy, and especially the modification by Finney, was theortically ideal, and in properly selected cases gave excellent results, but it was often impractical because of adhesions or tumors, and could not be generally adopted; its simplicity could not recommend it, because gastroenterostomy might be performed as easily, as quickly, and with a mortality as low, and was applicable in nearly all cases. Wölfler's anterior anastomosis and von Hacker's posterior anastomosis with their modifications were the two methods generally adopted, but Roux's method of cutting the intestine across, implanted the distal end into the stomach, and the proximal end into the side of the distal end was theoretically ideal, and avoided regurgitant

vomiting, but it was difficult and prolonged, and if universally accepted would have a mortality that would be prohibitory. Gastro-enterostomy by the surface to surface anastomosis of the stomach and the jejunum was applicable to the greatest number of cases, and might be performed in nearly any condition requiring stomach drainage. Anterior gastro-enterostomy as an operation of election must very soon become obsolete, and would finally be accepted only where an operation was necessary to give temporary relief, or where the posterior operation was contra-indicated, because of adhesions and the feeble condition of the patient that demanded a quick operation. The ideal operation of election must eliminate the intestinal loop, and this might be done by the posterior method, by attaching the jejunum very near its origin under the transverse meso-colon; the bowel incision might then be made longitudinally or transversely, but was usually made in a longitudinal direction, Kocher and Mikulicz making transverse incision. This method was preferable if the opening into the bowel could be made large enough to permit of continued unimpeded drainage, but the anastomosis was more difficult than in the longitudinal bowel incision. Posterior gastro-enterostomy was now the accepted method with Robson, Mikulicz, Kocher, Czerny, Moynihan and Mayo, with no higher mortality than the anterior method, with nearly an absence of regurgitant vomiting and other immediate complications, and with ultimate excellent results in drainage, the gastrojejunic opening seldom contracting enough to induce pathological condition. The McGraw ligature in the anterior method gave good immediate results, but we could not judge correctly of the ultimate results in the patency of the gastrojejunic opening, and the ligature had probably not been tested in the posterior method. The Murphy button had the advantage of being quickly applied, but except in selected cases possessed no advantages over the suture, and was more frequently followed by complications.

The Indications and Limitations of Various Operations on the Gall-Bladder.—Dr. Charles A. L. Reed, of Cincinnati, Ohio, reviewed the various operations usually performed for the relief of surgical conditions of the gall-tract, summarizing them under the heads of cholecystotomy, cholecystectomy, cholecystenterostomy, and choledochotomy. He recounted his experiences during the last fifteen years, first with cholecystotomy, and cited cases to show that operation had distinct limitations, and urged that it ought not to be done in cases in which prolonged drainage was required, or in which there was a demonstrable permanent obstruction in the common duct, or in cases in which there was reason to suppose that such obstruction might develop. He insisted that the gall-bladder exercised functions of importance in the human economy, and that consequently it ought not to be removed without adequate cause. He recognized as legitimate indications for cholecystectomy conditions of atrophy and malignant degeneration of the gall-bladder and cases in which benign neoplasms caused practical obstruction of that viscus; but insisted that the operation ought never to be done when the gall-bladder could be restored to functional integrity with safety to the life and health of the patient. He urged that cholecystenterostomy should be considered the operation of choice in all cases in which the gall-bladder and a desirable segment of the intestinal tract, preferably the duodenum, the ileum, or the jejunum, in the order mentioned, should be approximated, and in which drainage was demanded for accumulations within the gall-bladder of whatever character; for occlusion of the common duct or following operations upon it; for cholecystitis in which the gall-bladder could be safely left *in situ*, and in all chronic fistulæ of the gall-bladder. It ought, also, to be employed to complete an anastomosis in cases in which nature had atempted to accomplish the task by the formation of firm adhesions between the gall-bladder and the intestines.

Ectopic Pregnancy.—Dr. F. F. Lawrence, of Columbus, Ohio, reported cases of ectopic pregnancy. In ectopic pregnancy the death-rate should be lower than in appendicitis, providing the surgeon got the cases before rupture. The diagnosis of tubal pregnancy before rupture should be made with as much or greater certainty than could a normal pregnancy before the third month. The fact that a tubal pregnancy was allowed to go on to rupture was a reproach to obstetric practice, first, because of indifference or carelessness which prevented proper investigation of the case early. This might be on the part of the patient or physician, but the real fault lay in the indifference to obstetrics which had permitted women to look upon pregnancy as a simple matter, and not one demanding the attention of skilled service except in complicated labors. In unruptured cases the tube could be more safely removed through abdominal incision. In ruptured cases he was convinced that it was often very unwise to attempt to remove a patient to a hospital. The chances of infection in her home could be more readily overcome than the danger of increasing hemorrhage by handling. In all cases of extrauterine pregnancy, tubal disease, which was bilateral, seemed well established. The danger of a catastrophe in case the unaffected tube was left was therefore great, unless that tube be safely obliterated. Absorbable ligature was not a safe material to use for obliteration. Silk of large size only should be used. The better practice was to remove both tubes, retaining the ovary, if possible.

Etiology of Ectopic Gestation.—Dr. H. B. R. McCall, of Kansas City, Mo., read a paper on this subject, in which he discussed the genealogy of ectopic gestation relative to evolution. He submitted classifications, reported cases, and made a plea for early diagnosis, and operation, with special reference to etiology and diagnosis.

Brain Abscess of Otitic Origin.—Dr. George F. Keiper, of Lafayette, Ind., reported cases of brain abscess of otitic origin, and made some observations concerning brain abscess in general. Case I was an abscess of the right temporosphenoidal lobe. Recovery. No symptoms of brain lesion. No abscess suspected. Operation made for mastoiditis. Removal of necrotic bone forming the roof of mastoid antrum revealed abscess. No symptoms of aphasia. Case II. This case had longstanding otitis media, recurring frequently, and had often complained of pain on mastoid, which at those times was tender to the touch. When first seen, patient was comatose, with convulsions recurring frequently. Patient had had sixty in twenty-four hours prior to the author's first visit. The mastoid was opened, but no pus was found. He continued opening the skull upward over the temporosphenoidal lobe. Dura bulged. He incised freely, giving vent to flocculi and serum. Patient had but two convulsions

since. Regained partial consciousness, but died in forty-eight hours after operation.

Foreign Bodies in the Cornea.—Dr. Dudley S. Reynolds, of Louisville, Ky., said that injuries of this character should be classified according to the depth of penetration and extent of surface. The foreign bodies should be classified as metallic, ligneous, vitreous, and calcareous. Of whatever character they might be, no kind of foreign substance should be left long in the cornea. Where the epithelium alone was involved, the injury should be classified as severe. Wounds penetrating the anterior elastic layer, even though of very limited extent, should be classed as grave. Those which penetrate through the cornea should always be regarded as perilous. Treatment of the serious, the grave and the perilous varieties should conform with some general preconceived plan.

The Transverse Fascial Incision for Operations in the Pelvis.—Dr. Emil Ries, of Chicago, contributed a paper on this subject. In order to gain reliable fascial protection for incisions for pelvic work, it was desirable not to have to incise the fascia in the median line. Pfannenstiel's method was a useful improvement where the organ or tumor to be removed was not large. It began with a transverse incision through skin, fat and fascia. The fascia was then dissected up from the recti and raised as a flap with fat and skin. The recti were then separated and peritoneum incised in the median line. After the operation in the pelvis was finished, the peritoneum and recti were sutured in the median line, the fascia and skin transversely. The author had used the incision for various operations on the tubes, ovaries, uterus, appendix, and reported favorable results.

Suppuration of Nasal Accessory Sinuses.—Dr. J. A. Stucky, of Lexington, Ky., pointed out the importance of early recognition of suppuration of nasal accessory sinuses. Frequently peculiar anatomical inter-relationship of the different sinuses, when involved in suppuration process, rendered the symptoms obscure and misleading. Suppurative products might exist in latent form, giving rise to no local symptoms, and eventually resulting in systemic infection. Chronic inflammation in a closed cavity had a tendency to pus formation. He reported fatal cases due to absorption of pus or the invasion of suppurative inflammation through the optic foramen or holes in the cribriform plate to the base of the brain. The sequelæ of chronic suppuration of any accessory sinuses were frequently due to some form of neurasthenia and migraine. An increased number of cases were probably due to grip, pneumonia, and strenuous indoor life. The treatment was the same as for pus formation in any other part of the body, this is, free drainage. The middle turbinate most frequently caused obstruction of natural openings or a hindrance to free drainage, and the early removal decreased the necessity for more extensive and radical operation later.

Strictures of the Urethra.—Dr. A. Ravogli, of Cincinnati, Ohio, said that urethral strictures were affections of localized tracts of the mucous membrane and of the submucous layer of the urethra, resulting often from gonorrhea, and not rarely from trauma or from traumatic urethritis. The symptoms were mostly local, but at times they might be the cause of general symptoms and of neurasthenia. Strictures were of different varieties, spasmodic and organic. The organic strictures were to be divided into wide and narrow, the latter being the result of the former. Both were the cause of impairment of micturition and of the production of inflammatory symptoms of the genito-urinary organs. Strictures were somewhat diminishing in their frequency, and this must be credited to the recent method of treatment of gonorrhea. In their treatment, one might expect a great deal of benefit from systematic dilatation and from remedial applications, but in some very serious cases external urethrotomy was imperative.

The Perilous Calms of Appendicitis.—Dr. Robert Wallace Hardon, of Chicago, read a paper on this subject, in which he presented the following conclusions: (1) Defervescence of symptoms and apparent better condition of the patient do not always mean recovery, but may be the forerunner of a dangerous condition. (2) As there is no specific for the disease, no matter what treatment is used, the one who procrastinates should shoulder the responsibility for the death. (3) When a clear diagnosis is made, but one treatment should be advised, that of operation as soon as possible under the conditions, or the golden opportunity may be forever gone. (4) The physician who does not explain the great dangers of delay and the small comparative danger of operation, is doing his patient a serious injustice which often leads to fatal results. (5) Operation at the proper time usually greatly shortens convalescence, and eliminates all danger from this cause thereafter. (6) Procrastination is the greatest cause of surgical death, operation often being performed as a last resort when little hope of recovery exists.

The Prevention of Appendicitis.—Dr. William M. Harsha, of Chicago, stated that from available figures it would seem that this disease was more frequent in America than elsewhere. This was on the assumption that the mortality rate was much the same in England, Germany and France, where modern methods of medical and surgical treatment were practised, and where statistics were or should be reliable. In England and Wales, with a population of about 33,000,000, there were 1,244 deaths from appendicitis and perityphlitis in 1901, or 38 per million. In 1902 there were 1,485 deaths, or 45 per million. In Illinois, with a population of about 5,000,000, there were in 1903 471 deaths from appendicitis, or 94 per million. In Chicago alone, which represents nearly two-fifths of the population of the entire State, there were 249 deaths in 1902, and 260 in 1903, being at the rate of 140 per million. The same high death rate was approximated in other cities of the United States, especially in similar latitudes. New York City had, in 1903, 439 deaths, or 123 per million. Statistics of deaths from this disease in various cities, both at home and abroad, were given. Considering the causes that might be influenced by treatment, the author believed errors of diet were the most frequent. The disease occurred most frequently at the age and in the sex in whom faulty habits of eating and errors of diet were most common, from ten to thirty years. It was common to see attacks follow an immoderate meal, or the ingestion of indigestible articles of food. If one had transgressed in either of these ways and felt the approach of an acute digestive disturbance, the rational treatment was the prompt evacuation of the whole digestive tract, keeping it empty, and urging strict recumbency. Cholera morbus ushered in many cases of appendicitis, which were regarded as the primary trouble. The acute digestive disturbance, irritating the mucosa, was followed by stenosis of the base of the appendix and the infection ensued. This he had observed formerly in a considerable general

practice. While fecal concretions or foreign bodies were less frequent causes of appendicitis than was formerly supposed, they caused probably ten per cent. of cases. As to treatment, the individual case must be considered by itself, its etiology carefully studied, as well as any peculiarity, and treatment adapted accordingly. In one case it would be necessary to regulate the habits of eating, in another to cultivate immunity from colds or proper habits of exercise, while digestive disturbances of various kinds would require attention in others. In all the proper hygienic conditions should be secured to keep the vital resistance up to the highest point. During the past six or seven years he had advised these measures as preventive after one attack in which there had been no operation, and so far as can be known, he believed recurrence had not occurred in over 20 per cent., most of these being in young people, partly because of the greater frequency in the young, and in part he believed because of lack of intelligent cooperation on the part of the patient. The consensus of opinion was that more than 50 per cent. of the cases not operated upon recurred.

The Mortality of Appendicitis.—Dr. Channing W. Barrett, of Chicago, read an interesting statistical paper on this subject, which was accompanied by a series of tables. Table 1 showed that Chicago still had a mortality in appendicitis about equal to .01 of the mortality from all causes. Table 2 showed that the percentages of female mortality from appendicitis varied very little from the percentage of female mortality from all causes, and that appendicitis was to be looked for as common in the female, notwithstanding the old belief that it was rare. Table 3 showed the greatest mortality at the best period of life, early adult life, the greatest number dying at any one year of age being 22 at the age of nineteen years, the average age for all deaths being 26.54 years. Table 4 showed that leaving out the chronic cases the average duration of the disease in the 372 cases in which the time was mentioned was 833-76 days. Murphy's mortality cases showed that the average time after operation until death was 2.8 days. This demonstrated that his vast number of fatal cases were operated upon at the end of the sixth day, while all authorities conceded that an operation on the first or second day was safe and desirable. Table 5 showed that the most frequent cause of death from appendicitis was suppuration of the appendix, caused by perforation, gangrene, or passage of the infection through the wall, and peritonitis; and, further, that adhesions and obstruction were common. Many cases did not have the advantage of hospital treatment or an operation. An early diagnosis was more desirable, yet the Bureau of Vital Statistics considered that a diagnosis was not made at all in 105 cases; a few of the remainder were made by the Coroner. Some were made post-mortem, and one could never know how many were made too late for any operation to save life. The long, but only partial, list of vague diagnoses copied from the death certificates showed that in all probability some cases escaped detection. The author submitted the following conclusions: (1) An early diagnosis is of the first consideration. (2) All troublesome appendices should be removed without waiting for an acute attack. (3) All acute cases should be dealt with surgically in the interval between the onset of appendicitis and the dangerous rupture, without waiting for pus outside the appendix, for peritonitis, for adhesions, or for a possible but remote interval. (4) Cases of perforation or gangrene, with localized abscess, should be operated with drainage or removal of the appendix, according to the judgment of the operator. (5) Cases with perforation or gangrene without a wall of adhesion are in still greater need of an outlet for the infection to lessen the tendency of infection to travel inwards. (6) Price, Murphy, Hawkes, and others have shown a better percentage of recovery by the operative treatment of acute perforative peritonitis. (7) A case of acute appendicitis should be operated upon at anytime if the patient's condition will admit of an operation, unless the case is rapidly and beyond a question of doubt convalescing. In this latter case we should wait until all acute symptoms have passed. (8) Healthy appendices should be left alone. (9) Proper treatment does not contraindicate the use of stomach lavage, or the withholding of food, and when proper, these things should be employed, with or without operation. (10) Life is not the only consideration. The time of cure and after conditions are important. A case going through an acute attack without operation is saved by the adhesions. Adhesions are life-saving for the time, but they may be death-dealing afterward. The waiting treatment favors adhesions; early operation avoids them. An early operation sends the patient home in from ten days to three weeks. Twelve cases treated by the rest treatment, reported in the *Journal of the American Medical Association*, June 22, 1902, show an average of 60 7-12 days from the onset of the disease to the discharge of the patients from the hospital.

Remarks on the Etiology of Fissure in Ano.—Dr. J. Rawson Pennington, Chicago, said that a fissure might be located at any point in the circumference of the anal canal. Its most frequent location, however, was near the posterior median line. No satisfactory explanation for this fact had been given; neither had anyone proffered a satisfactory reason why it occurred in the anterior quadrant in less than one per cent. of the cases in males, and in more than eight per cent. of the cases in females. It seemed to the author that the theories usually taught and accepted as the cause of this disease were, at least in many cases, erroneous, and that we should have a more comprehensive etiology. He regarded the location of the ulcer as anatomical, and depended principally upon the support given to the tissues of the anal canal by the sphincters and levatores ani muscles. When the canal was overdistended, the dorsal surface received the least support from these muscles, the anterior the next, while the sides received the greatest. At the terminal portion this relative support is due to the difference in the distance between the posterior commissure and the tip of the coccyx, the origin of the external sphincter, and the tendinous center of the perineum, its insertion and the anterior commissure. Because of this difference, the posterior fibers of the muscle are more deployed than those of the anterior. Hence, when pressure was made from within outward it was obvious, since muscle fibers were easier separated or split than broken at right angles, that the weakest point in this muscle was at or near the posterior commissure; the next weakest point was at or near the anterior commissure. This latter point was weaker in women than in men. The lateral quadrants or sides received the greatest support from this muscle. Anatomical conditions and relations, almost identical with these, existed between the levatores and the proximal portion of this canal. Therefore, when this canal was placed under sufficient stress to rupture its tissues, the tear, all things being equal, should occur first on the dorsal surface, as it received the least muscular support; second, on the anterior surface, as it was the next weakest point, and, third, or last, on the sides. This was the sequential order in

which the respective tears of this canal should and do occur, and they not only corresponded with the weakest points in the muscular cylinder that surrounded and supported these canals, but with the statistics of the sequential location of fissure in ano.

The following papers were likewise read and discussed: "Causation and Radical Cure of Quinsy," by Dr. John F. Barnhill, Indianapolis, Ind.; "Cranial Injuries," by Dr. Shelby C. Carson, Greensboro, Ala.; "Internal Hemorrhoids, and Their Treatment," by Dr. Wells Teachnor, Columbus, Ohio; "A Case of Bilateral Tic Douloureux, treated by Removal of the Right Gasserian Ganglion and the Left Inferior Dental Nerve," by Dr. W. O. Bullock, Lexington, Ky.; "Hernia of the Tube," by Dr. Frank T. Andrews, Chicago.

Officers.—The following officers were elected for the ensuing year: President, Dr. Bransford Lewis, St. Louis, Mo.; First Vice-President, Dr. Frank P. Norbury, Jacksonville, Ill.; Second Vice-President, Dr. J. Henry Carstans, Detroit, Mich.; Secretary, Dr. Henry Enos Tuley, Louisville, Ky., re-elected; Assistant Secretary, Dr. John F. Barnhill, Indianapolis, Ind.; Treasurer, Dr. S. C. Stanton, Chicago, Ill.

Indianapolis, Ind., was selected as the place for holding the next annual meeting; the time, second Tuesday, Wednesday and Thursday in October, 1905.

NEW YORK NEUROLOGICAL SOCIETY.

Regular Meeting, October 4, 1904.

The President, Pearce Bailey, M.D., in the Chair.

A Case of Unverricht's Type of Family Myoclonus, But Without Epilepsy.—This was presented by Dr. L. Pierce Clark. The patient was a married woman, twenty-six years of age, of Irish descent. There was a family history of myoclonus in the father, uncle and sister; of facial tic in a grandmother, of hysteria in the mother and paralysis agitans in a great-aunt. The patient was well until her seventh year, at which time the myoclonus began. It consisted of arhythmic, clonic spasm of the left sternocleidomastoid muscle, and gradually spread into the entire left shoulder girdle, as well as the arm, trunk and thighs. Subsequently, the right side became affected in a similar manner. The muscles most markedly affected were the sternocleidomastoid, the trapezius, the deltoid, biceps, latissimus dorsi and glutei. The right side was most involved. Emotional excitement, embarrassment and anxiety increased the spasm. The gait was at times affected. The spasm was quieted by lying down. For the past eight years the spasm had been more or less continuous, with varying grades of paroxysmal intensity. It ceased during sleep. Speech was occasionally affected and swallowing was at times difficult. Laryngeal sounds were occasionally emitted. The patient had never suffered from epilepsy or from any attacks epileptoid in character.

Dr. B. Sachs asked how a case of this character could be distinguished from the *maladie des tic convulsifs*, to which the clinical picture bore a close resemblance? In Dr. Clark's case there did not seem to be anything more than a generalized convulsive tic, and without a distinct history of epilepsy he did not see how it differed from the affection described by the French writers.

Dr. Clark, in closing, said the question raised by Dr. Sachs had given rise to considerable discussion between the French and German schools. The case resembled Unverricht's type of family myoclonus in that the movements of the muscles were arhythmic, they were not purposeful, they were accompanied by paroxysms of intensity, but with no free periods. There was, however, no history of epilepsy, and some writers would no doubt classify the case as one of generalized tic.

A Case for Diagnosis.—This was presented by Dr. B. Sachs. The patient was a man, aged thirty-five years, who first came under the speaker's observation in 1897. He was a machinist by occupation. He had never come in contact with metallic poisons, and gave no history of gonorrhea or syphilis. He first noticed that pulling the left half of his mustache caused him no pain, while pulling the opposite half gave rise to the usual sensation. Subsequently, he had a carbuncle on the left side of the lip, which was opened without causing him any pain. Thorough and repeated examinations revealed nothing excepting a dissociated sensation in the distribution of the left trigeminal nerve. During the first year there was only a loss of pain and temperature sense in the greater part of the three branches of the nerve, with subsequent loss of sensation of the left cornea, and more recently, atrophy of the left masseter muscle. During his last examination of the patient, Dr. Sachs said, he noticed a slight involvement of the middle branch of the right trigeminus. There was no dissociation of sensation in other parts of the body, and no evidences of systemic or other disease. The knee-jerks were normal. Dr. Sachs said he had seen two cases similar to this one, in which the only symptom consisted of a dissociated sensation of the trigeminal nerve. One explanation he had to offer was that it was an unusual case of syringomyelia, in which the cavity formation was in the pons and not in the spinal cord. This he regarded as a rather venturesome diagnosis, because in such a case, in all probability, some of the other cranial nerves would have become involved after so many years. Another and more likely explanation was that the case was one of primary degeneration of the nerve, perhaps fibroid in character, such as had been described as occurring in nerves in other regions. Whether it would be proper to call it a neuritis or not he did not know.

Dr. George W. Jacoby said, that one of the things to be considered in connection with the case shown by Dr. Sachs was beginning tabes. The speaker reported a case of undoubted tabes that had been under his observation during the past eighteen years; in which the first symptom was an analgesia in the distribution of the middle branch of the trigeminal; there was not a dissociation of sensation, simply a reduction, which gradually became complete, and this persisted for five or six years before any other symptoms of tabes manifested themselves. In that case, Dr. Jacoby said, antisyphilitic remedies were given from the very onset of the analgesia, and persisted in for a long time, without exerting the slightest influence upon the subsequent development of the tabes.

Dr. William M. Leszynsky called attention to the decided atrophy of the muscles in the case shown by Dr. Sachs. The speaker said he saw no reason why the dissociated sensation should necessarily indicate the presence of syringomyelia. Dissociated sensation was occasionally seen in other conditions affecting the peripheral nerves.

Dr. Joseph Collins said, that while cases of tabes like the one described by Dr. Jacoby were very uncommon, they were occasionally met with, and he

had recently seen one come to autopsy, after twelve years' observation. In those cases, however, there was no pronounced muscular atrophy, which was such a conspicuous feature in Dr. Sachs's case, constituting, practically, a facial hemiatrophy. The more or less uninterrupted quivering or flickering of the muscles, particularly the masseter, as well as the distribution and course of the affection, militated against a peripheral trigeminal lesion. Dr. Collins said he was inclined to regard the case as one of central syringomyelia.

Progressive Muscular Atrophy.—Dr. L. Pierce Clark said, that cases of progressive muscular atrophy had been reported which were similar to the case shown by Dr. Sachs. In those cases the skin itself was not involved to the extent that it was in facial hemiatrophy. The case might be one of progressive muscular atrophy, with sensory changes due to degeneration of the sensory root.

Dr. Sachs, in closing, said he did not think the case had any features in common with ordinary facial hemiatrophy. For a period of five years, this patient only presented sensory symptoms. The apparent atrophy was due to wasting of the muscles supplied by the motor branch of the trigeminus. The quivering of the muscles, to which Dr. Collins had called attention, was more apparent than usual, and was probably due to temporary nervousness. The speaker said he had kept the possibility of early tabes in mind, but had found no evidences of that disease.

Dementia Præcox.—Has the recognition of dementia præcox advanced our conceptions of the various forms of mental derangement occurring in the adolescent period? Is not the present tendency to give too grave a prognosis in the youthful insanities? How frequently does dementia follow the mental derangements of early life?—Dr. B. Sachs, in opening the discussion of this subject, emphasized the fact that some cases correspond accurately to the types of dementia præcox described by Kräpelin and his followers. This was particularly true of the earlier forms of mental derangement occurring in members of families in which there was a very marked psychic taint, but even in these, many years might pass before an appreciable dementia sets in. The term dementia præcox, he thought, should be carefully restricted to such cases in which mental deterioration, at an early stage of the disease, was clearly recognizable, and should not be applied to those in which a dementia might set in in the far-distant future. The diagnosis of dementia præcox placed the stamp of an uncurable malady upon persons who might be sufficiently alert to be useful to themselves and to others for a long term of years, and in that sense did them distinct injustice. There seemed to be little gained in grouping widely differing cases under one heading. The older plan of clinical subdivision was more commendable, and the tendency to dementia should be insisted on only when there was reason to think that a deterioration was certain to develop at a relatively early period.

Dr. Adolf Meyer said, that the question under discussion was a very broad one. Largely through the influence of Kräpelin's earlier writings, the speaker said he had come to regard katatonia and hebephernia as degenerative conditions, and he was greatly surprised to see, in the fifth edition of Kräpelin's book, that the writer had apparently entirely changed his views on the subject, and had completely eliminated the degenerative features of those psychoses. Indeed, the very mention of degeneration to members of the Heidelberg school in 1896, when this great change took place, was looked upon as a sort of heresy. Instead of regarding these diseases of a degenerative origin, it was stated that they might befall anybody, just as general paralysis might befall anybody, and that they tended to end in dementia. Dr. Meyer said, he had always been inclined to believe that Kräpelin's rather sudden change of views was due to controversial reasons rather than to an actual conviction. The chief advantage that had been gained by Kräpelin's writings was that it had induced psychiatrists to break away from the old tradition of classifying all forms of insanity into melancholia, mania and paranoia, thereby neglecting many well-marked and striking forms of mental disease which could be readily recognized. Undoubtedly, Kräpelin went too far, a fact that he himself admitted when he said that the entire group was only classified provisionally, and would have to be still further subdivided. Kräpelin's description of dementia præcox was, on the whole, remarkably clear, and he was very painstaking in making the diagnosis. In a given case, all the symptoms might not be present, yet the patient might show some evidences of deterioration. Such cases might be regarded as allied to dementia præcox if the symptoms pointed sufficiently in that direction.

Dr. William Hirsch said, it seemed to him that this controversy concerning dementia præcox, as well as some other modern diseases, was largely a controversy about names. If it were not for the name dementia præcox, such a discussion would be practically unnecessary. The term did not originate with Kräpelin, but was used by Pick, of Prague, fully thirty years before, to describe a condition very similar to that to which it had been applied by Kräpelin. The clinical picture of dementia præcox is so broad that near every juvenile case of insanity would fit into one of the various categories, and the question arises whether there is really one important feature which all these cases have in common. Dr. Hirsch said they surely had nothing in common in symptomatology, because the clinical picture was too broad. Was the dementia a common feature of dementia præcox? Personally, the speaker said, his experience coincided with that of Dr. Sachs. He could not convince himself that all juvenile psychoses, whether of the katatonic or other types, would terminate in dementia. There was one feature, however, that was common to all these cases of acute juvenile psychosis, namely, that they all occurred on a degenerative basis. "We would always draw the conclusion that we had not to deal with a normal individual. These juvenile psychoses only occurred in individuals with inferior mental powers, and this fact should always be borne in mind in connection with the prognosis. Such a person might return to his relatively normal state, that is, to the condition he was in before the onset of the attack, which was never an absolutely normal condition. The fact was often lost sight of that these people never had a normal mind, but taking that for granted, it went without saying that any acute mental disease might intensify this mental inferiority, and that the patient might be worse off than he was before. Even if very decided dementia was present during the acute stage of the attack, it would not necessarily be a permanent condition; the patient might recover from this dementia and regain his relatively normal condition. The impaired mental condition of these pa-

tients, Dr. Hirsch said, did not necessarily imply a lack of intelligence, but might be characterized by hypochondriasis, by a lack of mental equilibrium or by morbid impulses.

Dr. Emmet C. Dent said, that a recent anaylsis of the statistics at the Manhattan State Hospital for the past year showed that out of 911 patients admitted, 290, or about 31 per cent., were cases of dementia præcox. The speaker said, that after several years' study of Kräpelin's theory, he was still inclined to believe that it was premature to discuss it. The group of cases included under the term dementia præcox was a large one, and in the course of time more appropriate names would doubtless be found under which the various types could be classified. A case of dementia præcox, when properly defined, was just as distinct a type as depressive insanity.

Dr. T. P. Prout said, that five or six years ago he made some examinations of the blood in cases of so-called dementia præcox, and found that the results he obtained were very variable. In some of the typical cases, during the early stage, there was marked leucocytosis, while in others the number of leucocytes was decidedly diminished. A similar discrepancy was noticed in the differential count. It therefore seemed to him that different types of mental disease were embodied under this head.

Dr. Allen Ross Diefendorf, of Middletown, Conn., said that melancholia was recognized as a psychosis of involution, while dementia præcox was one of adolescence, and he could see no close relationship between the two. The symptoms of melancholia, as at present understood, were well defined, and it could be safely said that the condition was very rarely encountered during the period of adolescence. A review of about one-half the cases admitted to the Connecticut Hospital for the Insane during the past five years, showed about 184 cases of dementia precox. A subsequent review of those cases showed that twelve were mistaken for melancholia. Of these, seven were of katatonic type, or were later recognized as katatonia, and five as hebephrenia. The speaker thought there was very little danger of confounding melancholia with dementia præcox.

Dr. Joseph Collins said, he did not agree with Dr. Sachs that the modern psychiatrist showed a tendency to make the diagnosis of dementia præcox with alarming frequency, nor did he agree with Dr. Hirsch that there was anything typical in the clinical picture of this psychosis, or anything in common between the various types of the affection, as described by their originator. Furthermore, he did not think that Kräpelin maintained that position. In his study of that writer's work, he could recall no ground for the statement that all these cases occurred on a degenerative basis. On the contrary, Kräpelin maintained that dementia præcox was a disease that occurred in individuals who were apparently sound, and that it was due to an auto-intoxication.

Dr. Edward D. Fisher said, he was inclined to think that Kräpelin allowed a wide latitude in his differential diagnosis of dementia præcox, and that his cases were rather younger than those cited by Dr. Sachs. For example, take an apparently normal individual of fourteen, sixteen or eighteen years, who suddenly, with or without psychosis, may show himself unfit for the work he is doing at the time, and is never able to take care of himself after that. We may have here a type of dementia which may never reach an extreme degree, that is, never go on to amentia. Such cases, Dr. Fisher thought, represented a large class to which Kräpelin referred in his writings.

Dr. Dent, in reply to a question, said that the cases of dementia præcox he has seen ranged in age from fourteen to twenty-five years. The average age was about twenty years.

Dr. Sachs, in closing, said that the figures quoted by Dr. Dent showed that a large proportion of the patients at the Manhattan State Hospital were being admitted under the diagnosis of dementia præcox, and he questioned whether many of those cases had gone on to a condition of complete dementia. The only point he wished to make was to throw a little doubt upon the extremely grave prognosis that had been given in this class of psychoses in recent years under the teachings of Kräpelin.

BRITISH MEDICAL ASSOCIATION.

Seventy-second Annual Meeting, held at Oxford, England, July 26, 27, 28 and 29, 1904.

SECTION ON TROPICAL MEDICINE.—*Continued.*

(Continued from Page 855.)

Leishman-Donovan Bodies.—These parasites were discussed by a number of the members of the Section on Pathology. Dr. W. B. Leishman, of London, first took up the main facts known about these bodies. Since first observed a large number of observers have written concerning them. Donovan, Marchand and Ledingham, Manson and Low, Bentley, Rogers, and others have observed them, and it is becoming more and more evident that the disease associated with their presence is by no means uncommon in tropical countries, and there can be little doubt that, as the parasites themselves and the methods necessary for their demonstration become better known, more will be learned concerning them. Cases have been reported from countries so widely apart that it would be rash at this stage to attempt to assign geographical limits to the disease. The first case in which the parasites were found was that of a soldier, invalided from Dum-Dum in 1900 with tropical cachexia and splenomegaly, and soldiers at Netley presenting a similar clinical picture were so frequently found to have served in or near this station that he termed the condition "Dum-Dum fever." Such a name was, however, only intended as a temporary expedient for the avoidance of a periphrasis in speaking of the condition with which the bodies were associated, and, as it appears likely that the disease may prove to be identical with kala-azar, this well-known name will probably be adopted. Up to the present moment cases have been reported from three or four widely separated districts of India, from China, Tunis, Algiers, Arabia and Egypt. As knowledge of these endemic areas is added to, it would be of great interest to endeavor to find out any physical peculiarities they may possess in common, as this may help in the search for the alternative host which the analogy of malaria and other protozoal diseases would suggest to be necessary.

Distribution of the Parasites in the Body.—Originally found in the spleen, the parasites have since been met with in the liver, the mesenteric glands, the bone marrow, the kidney, and in ulcers involving the intestinal mucosa. The great majority of those who have searched for them in the peripheral blood have failed to detect them, but M. Laveran is of the opinion that certain small bodies occurring in the red

corpuscles in some of his specimens are young forms of the parasite. The most exhaustive accounts of the distribution of the parasites are those of Marchand and Ledingham and of Christophers, and their results are in many respects in marked agreement. According to these and other observers the parasites appear to be chiefly, if not solely, intra-cellular, and are met with in the protoplasm of large mononuclear cells, which are probably, as Christophers suggests, "macrophages," and of the same nature as those large phagocytes which, in malarial cases, are filled with ingested melanin granules. A fact which had been noted, and which appears to be significant, is that neither the parasites nor the cells which harbor them appear to suffer from their mutual association. In specimens obtained by splenic or hepatic puncture during life the parasites are, however, usually found free or in groups of several members, and such free or agglomerated parasites are frequently seen to be embedded in a structureless matrix or stroma, straining grey or pale blue with Romanowsky's method. This stroma or matrix is of importance, as it is largely owing to the different conceptions as to its origin that different views have been taken as to the nature of the parasite. That the true origin of this stroma lies in the disintegration of those large mononuclear cells through mechanical violence, and that the stroma represents a fragment of the protoplasm of one of those host cells, appears probable from the work of Christophers and of Marchand.

Symptomatology.—(1) Splenic and hepatic enlargement—the former being apparently constant, while the latter is common but not invariable. (2) A peculiar earthy pallor of the skin, and, in the advanced stages, an intense degree of emaciation and muscular atrophy. (3) A long-continued irregularly remittent fever, of no definite type, lasting frequently for many months, with or without remissions. (4) Hemorrhages, such as epistaxis, bleeding from the gums, subcutaneous hemorrhages or purpuric eruptions. (5) Transitory edemas of various regions or of the limbs. (6) Complications, such as congestion of the lungs, diarrhea and dysentery, have been frequently reported, and are occasionally the immediate cause of death. (7) Blood count. The cases coming under his own notice have shown a marked mononuclear increase, an interesting point, if confirmed by further experience, in view of the proved absence of malaria. To these positive signs may be added certain negative ones of hardly less importance: First, the absence of malaria, except as a concurrent affection, which yields to appropriate treatment; secondly, the negative result of the agglutination test to typhoid and Malta fever; and, thirdly, the resistance to medication, and especially to quinine—at all events, in the later stages of the disease.

Relation to Kala-azar.—It will be noticed that the symptoms detailed are very similar to those of kala-azar, a disease which has furnished matter for discussion at previous meetings of this Section, and concerning whose causation great differences of opinion have existed. He had suggested in his original communication that search should be made for these bodies in kala-azar, and Bently has since reported finding them in the spleen in cases of this disease, while his results have been confirmed more recently by Rogers. It is, perhaps, too early to say definitely that they are the cause of kala-azar, but it certainly looks as though this were the case, as they seem to occur constantly in this disease. If it should be so, the question arises whether the other cases in which the parasites have been found are identical with the kala-azar, and, if this identity is proved, we must then admit that the geographical distribution of kala-azar is much wider than has been supposed, and, further, that it is not uncommon amongst Europeans.

The Nature of the Parasite.—On this point, so important for the solution of many of the unsolved problems in connection with the disease, there has been a divergence of opinion, and it is much to be hoped that the question will soon be definitely settled. When it is, analogy should help us in clearing up the rest of the life history of the parasite, and put us on the track to what should be our ultimate goal—the prevention and, if possible, the stamping out of the disease. Stated briefly, the views that have been enunciated are the following: (1) Major Ross, working with films sent to him by Donovan, came to the conclusion that the bodies represented a new genus, belonging to the sporozoa, which he did me the honor to name Leishmania. (2) M. Laveran, also working with films from Donovan's cases, pronounced the bodies to belong to the piroplasmata, and gave them the name *Piroplasma Donovani*. (3) In his own opinion they appeared to represent a stage in the life-history of a flagellate organism, closely resembling a *Trypanosoma*, if not actually belonging to that genus. A few of those who have recorded cases of the disease have expressed their views upon this question of their nature, but Marchand and Ledingham, as a result of the study of their case, have come to the same conclusion as myself. To examine these views more in detail;—first, M. Laveran's view, that they are a species of *Piroplasma*—A parasite of the red blood corpuscles—has met with little support from other observers, whose most careful search has failed to demonstrate their presence in the red cells of the peripheral circulation, while, further, it has been pointed out that the arrangement of the chromatin, the method of apparent multiplication, and the tendency to occur in the protoplasm of the large mononuclear cells of the spleen and liver further militate against this theory. Such high authorities as Manson, Ross, and Marchand have also pronounced against this view. When the parasites are very numerous in a film it must happen at times that some are superimposed on the red cells, and when this occurs it is no easy matter to say whether it is a case of a true inclusion or not. But, in addition, Laveran has found pyriform bodies recalling the shape of *Piroplasma bigeminum* and he further regards the pale, grey-staining stroma, frequently seen surrounding the bodies, as representing the degenerated remains of the red corpuscle which harbored the parasite. A more probable explanation of this stroma appears to be that of Christophers. In a later publication Laveran reports that he has met with small intracorpuscular bodies in some of Donovan's films, taken from the peripheral blood of patients in whose spleens the parasites had been detected by spleno-puncture. These bodies Laveran considers as young forms of the *Piroplasma*, and he mentions a series of points in which they appeared to him to differ from young malarial parasites. This observation has not yet been confirmed.

Secondly, in Major Ross's view one has to deal with a representative of a new genus of the sporozoa, and he regarded "the individual bodies as spores

produced in the matrices, which would appear to be relics of the parent organism." In this connection it may be noted that the parasites found by Wright in a Delhi boil, may appear to be either identical or very closely related to the spleen bodies, are also regarded by him as belonging to a new genus, to which he has given the name "*Helcosoma.*" His own view is that the new bodies represent a stage in the development either of a *Trypanosoma* or of some closely-allied member of the *Flagellata.* Marchand and Ledingham endorsed this close resemblance, and also supported the deduction based upon it. Schaudinn, in following the various transformations undergone by a blood parasite of the stone owl when taken into the stomach of a mosquito (*Culex pipiens*), comes to the conclusion that this *Halteridium* is in reality a sexual form of a true trypanosome, to which he gives the name *Trypanosoma noctuae.* Again, Prowazek, working on similar lines to those of Schaudinn with a parasite of the house fly—*Herpetomonas muscæ domesticæ*—finds similar trypanosomal forms which also assume resting forms in much the same manner as *Trypanosoma noctuæ.*

From the descriptions and figures given by Schaudinn and Prowazek of these resting forms of trypanosomata, a very close resemblance may, he thinks, be traced between them and the new bodies, and in this resemblance lies the possible explanation of the flagellate origin of the bodies spoken of.

Elimination.—A fact of great importance in connection with the possible means by which the parasites are eliminated from the system is the presence of the bodies in the ulcers of the intestinal mucosa. This fact was brought out by Christophers and also by Manson and Low, and, from the frequency with which dysenteric complications have been reported in the course of the disease, it seems probable that this ulceration is a fairly constant feature. The parasites have not yet been found in the urine, but, as their presence in small numbers in the kidney has been noted, this is a possibility not to be overlooked. With regard to the discovery of Wright, already alluded to, that very similar parasitic bodies are met with in the well-known Delhi boil, it is obviously of the first importance that the identity or non-identity of those parasitic bodies with the splenic bodies should be established, and it is possible that the cercomonads which Ross found in these boils may be developed from, or may develop into, these bodies.

Cachexial Fever and the Leishman-Donovan Bodies.—Dr. Leonard Rogers, of Calcutta, presented a highly interesting paper on this subject. In a previous paper on cachexial fever he had found the parasites originally found by Cunningham in the Delhi boil many years previously, and a series of observations with examination of the blood from splenic punctures has shown him the probable identity of cachexial fever and the new parasites.

Races Attacked.—The great majority of the patients at the Medical College are natives, and my cases include Hindus, Mohammedans, Chinamen and Burmese women, and also two Europeans. Several of them had first been attacked with the fever while living in Calcutta. In addition to these he had found the parasite in the spleens of four cases in the European General Hospital, two being adults and two children, while several other similar cases clinically are under observation there, so that Europeans not infrequently suffer from the disease. Further, the disease frequently attacks more than one member of a family even among Europeans, a father and child having died of the disease, both with cancrum oris, in the European Hospital recently, while at the present time a mother and son are suffering from the disease there, in both of whom the parasite was found by spleen puncture. This, he pointed out in his original report, was the most characteristic feature of the distribution of kala-azar cases, in which it was the rule rather than the exception in hospital cases for at least half the household to have died of the disease. A similar, although much less marked, tendency is also present in the endemic form.

Cultivation of the Protozoal Parasite.—The recent cultivation of *Trypanosoma* has led him to try to obtain similar results with the parasites of cachexial fever by means of adding the blood obtained by spleen puncture to a small quantity of sterile citrate or soda solution, to prevent the blood clotting, and then keeping it under different conditions. Although when the solutions were kept at blood heat the parasites very rapidly degenerated and disappeared, yet when placed in a cold incubator at 27° C. and films made daily, they retained their natural conditions for several days and stained perfectly. Moreover, they increased markedly in numbers, so that in some instances, instead of two or three in a field of an oil immersion lens, as in the freshly-taken blood, after a day or two scores, and even a hundred, very young forms could be found in the same area. Further, very numerous dividing forms were found, even in a single field, although in the original specimens these were very few and far between, and required much searching in specially good specimens to enable even a few to be found, while in my experience the very young forms, which were so numerous in the cultures, are very rarely met with in fresh spleen-puncture blood, and then only within large cells, and not free in a gelatinous zooglea mass as in the cultures. These multiple forms result from the repeated subdivision of the nuclei of the ordinary oval form, as described in my former paper. In addition to this method of division, another frequent manner is a single division of both nuclei, followed by the splitting up of the parasite into two, the separation usually beginning from one end. The profession then has clear evidence of the survival and multiplication of the organism outside the body. As at a temperature of 27° C. the parasites only lived for three or four days, he next reduced the temperature of the cold incubator to 22° C. This temperature he found to be more suitable to the parasites, as they multiplied more readily, and when very few at first, several could easily be found in a field after a day or two. Further, he noticed that many forms of a considerably larger size than he had seen in fresh blood films appeared in a single day. This caused him to look out for flagellated bodies, for on first finding the spleen parasites in Dinajpur he was struck by the resemblance of the double nuclei, one larger than the other, with those of *Trypanosoma,* as Major Leishman had been before. Within the last few days in two of his cultures unmistakable *Trypanosoma* have appeared, together with smaller pear-shaped-flagellated bodies like those described by Plimmer in tsetse fly disease and other intermediate forms. The most marked of these cases (from which the illustrations have been taken) showed completely developed *Trypanosoma* with thick flaggella, macro-nucleus and micro-nucleus after incubation for one day, while the living forms were also seen in the blood culture moving rapidly among the corpuscles. They were quite numerous, and could readily be found after only a short search in a stained film, as will be seen from the specimen sent. This case was a typical one of cachexial fever in a Chinaman, whose spleen blood before incubation showed only fairly numerous

oval forms described by Leishman. This case had also been in hospital for fever two and a half months before, at which time he also found a few typical oval parasites by spleen puncture. The other case in which the trypanosomes have developed was by good fortune a case of kala-azar from Assam, from whom his assistant, Assistant Surgeon G. C. Chatterjee, kindly got some blood by spleen puncture, and after incubating for five days at 22° C. were found in the citrated blood a number of intermediate forms and a few full-developed trypanosomes. The fully formed trypanosome has, therefore, been already found in his cultures in both the endemic cachexial fever of Lower Bengal and also in the epidemic form of Assam, known as kala-azar, and the true nature of the organism is at least clear, Major Leishman's original hypothesis that the bodies he found were degenerate trypanosomes not being very far from the truth, as they must now be looked on as one stage of the epidemic went, than those whose temperature found by him.

Treatment.—Quinine has been unavailing. Segregation alone has resulted in any measure of success from the prophylactic side.

Piroplasmosis.—Major C. Donovan, of Madras, contributed to the discussion, basing his remarks on the observations of 72 cases of this old type of disease of supposedly newly discovered etiology. He proposes the name Piorplasmosis, believing that Laveran is correct in assigning the parasite to the genus *Piroplasma*. The clinical description of the disease was dwelt upon at length.

Notes in Kala-Azar.—Dr. Chas. A. Bentley, of Tezpur, Assam, read this paper. His conclusions were as follows:

It appears that the clinical history and the epidemiology of kala-azar gives certain indications as to necessary lines of research. It has been my experience during the four years during which he had been familiar with the disease that cases suffering from severe fever appeared to be more dangerous, as far as the spread of the epidemic want, than those whose temperature was more frequently near the normal.

It is these cases with high and continued fever who show on splenic puncture a larger proportion of fission and conjugation forms than the milder type of case. Again he had frequently noticed when the epidemic was at its height that cases which showed dysenteric symptoms, and especially those who became bedridden while suffering from dysentery, were sure to be followed by fresh cases in the same household or among the attendants. When the intestinal form of the disease is in abeyance, the epidemic gradually assumes a milder type, with a corresponding decrease in the case mortality. Another fact which appears to him to be of importance in regard to any investigation of the disease, is the comparative immunity of Europeans. Although isolated cases are met with in Europeans, they are uncommon. This fact appears to indicate that certain conditions are necessary for the spread of the disease, to which Europeans as a class are rarely exposed; and therefore the careful study of the case history of such patients when they are met with may be expected to give a valuable indication regarding the source of infection.

Tropical Splenomegaly and Oriental Sore.—Lieutenant S. R. Christophers said that whoever may have first seen the parasitic bodies variously known as the Leishman-Donovan bodies — *Piroplasma Donovani, Leishmania*, or *Helcosoma*—it is undoubtedly chiefly owing to the researches of Donovan that the occurrence of an entirely new parasitic disease of man was first brought to the attention of parasitologists and students of tropical medicine generally. With Donovan's discovery of the disease in Madras and Laveran's definite announcement of the parasitic nature of the bodies, speculation at once became rife regarding their zoological position, life-history and method of transmission. The earliest researches centered chiefly around the morphology and the zoological affinities of the bodies. They were thought by Leishman to be flagellates, on account of the conspicuous chromatin masses, which certainly appear to represent a karyosome and centrosome very like those of the trypanosomata. But that they are any form of degenerated tryphanosome is exceedingly unlikely in the face of the large number of recorded cases in which no trypanosomes have been present. The same unlikelihood pertains to their supposed affinities with the genus *Piroplasma*, and the discovery by Wright of the bodies crowded in the cells of granulation tissue in tropical ulcer would appear to be the final death-blow to this view. It has been suggested that the bodies are of the nature of micro-sporidia, but the proof for this rests on no further evidence than their remarkable uniformity in size and appearance. On the data we have at our disposal, it is indeed impossible to place these bodies in any of the genera or better known divisions of the sporozoa. A good deal of speculation has raged around the nature of the so-called "matrix" of Ross, "zooglea mass" of Manson, and "red corpuscle" of Laveran. In his first report he gave reasons for considering this nothing more or less than the cytoplasm of endothelial cells of the spleen, more especially that derived from the large macrophages which bud and vacuolate so as to give rise to the curiously definite masses in question. The process is much increased by the fluid usually present in the barrel or needle of the syringe used for puncture. A study of sections shows very clearly the real condition, which is one of endothelial cells gorged with the parasites. In regard to the nature of the infective process, it has very generally been taken for granted that the recently discovered parasite is a blood parasite, much in the sense that the malarial parasite is. If Laveran should be right in his surmise that the parasite is a species of *Piroplasma*, this will, of course, be true. As matters stand at present, the parasite does not appear to be related to this genus or to be a parasite at any time of the red cell. Are they to be considered as parasites of the plasma? On this point he has no hesitation in saying from the result of his recent researches that they are probably a blood parasite in no other sense than are the organisms of septicemic infection or the tubercle bacillus. While the attention of many observers was still directed to the novelty of the presence of the bodies in the spleen and liver of cases of tropical splenomegaly, Wright, in America, had, apparently independently, discovered the same bodies in large numbers in the granulation tissue of tropical ulcer, a lesion which had long been recognized as probably a specific local granuloma. That the bodies described by Wright are identical with those found in cases of enlarged spleen in Madras cannot be doubted after a study of the excellent photographs which accompany his paper. We also have the important communication from Captain James, that abundant forms, indistinguishable from those in the Madras cases and in kala-azar from Assam were found by him in cases of oriental sore from North India. The general pathology of the lesion and the relation of the bodies to the tissues as described by Wright, makes it seem certain that in this case the newly discovered parasite is acting as the causal agent in a focal granuloma of the skin. Shortly after Wright's paper reached India, Donovan

found the characteristic bodies in small numbers in ulcers in an advanced case of the Madras disease with enlarged spleen and cachexia. Stimulated by the discoveries of Wright and Donovan, he examined very thoroughly the tissues of fatal cases of the disease, especially with reference to the skin and intestinal lesions found in such cases. The result has been to throw a considerable amount of light on the nature of the infective process. Bodies were found in the spleen, liver and bone marrow, intestine, lungs, testis and kidneys. In his first report he has already shown that the apparently free forms seen in specimens of splenic blood cannot be considered as other than forms artificially liberated by rupture of cells, more especially the large macrophages. The same relation holds good in the case of the liver and bone marrow, and in all three organs the condition may be described as an engorgement of the endothelial cells with the parasite. In the lung, testis and kidney, bodies were much less numerous, but were readily seen lying in cells of endothelial nature. Free forms were never seen in sections. In unulcerated papules of the skin, in small and large ulcers of the skin and of the intestine, the bodies were consistently present. They were as a rule scattered singly through the tissue, and appeared to be lying embedded in the cytoplasm of tissue cells. Closer investigation showed that they lay in the endothelial cells of the finest capillaries. No bodies were ever detected lying free in the lumen of vessels. In larger vessels, in the immediate neighborhood of granulation tissue, endothelial cells were seen containing from two to six bodies, and in many of the still larger ones cells crowded with bodies almost blocked the lumen. Briefly stated, in infection by the Leishman-Donovan bodies a type of infection exists in which the vascular endothelium is mainly implicated. The importance of such a fact is manifest. In the first place, it suggests the comparison of the Madras disease (chronic malarial cachexia) with the usual type of septicemia, in which, from the researches of Werigo and Kuhnan, it is evident infection of the blood stream with the septic organism is chiefly shown by the deposit of forms in the endothelium and leucocytes of the viscera. If, inded, we say that the disease seen in Madras is a systemic infection of septicemic type, we shall most nearly express what is known as to the nature of this new protozoan disease. This view will also allow us to see in oriental sore a local infection by the same organism. As regards the cycle of development of the parasite, multiplication of forms is mainly by binary fission, the larger fission forms being of secondary importance. The parasites having entered or been taken in by an endothelium cell, would appear to proliferate, causing eventually the disruption of the cell and the temporary setting free into the blood stream of the crowd of contained bodies. There does not appear to be any intracellular digestion of forms included in the endothelium cell, and this latter very probably constitutes a suitable host for the parasites, in spite of the fact that it may originally take them in by reason of its phagocytic properties.

Leishman-Donovan Bodies in Ceylon.—Dr. A. Castellani, of Florence, reports having found these bodies in patient, with tropical splenomegaly, in Ceylon, and Dr. Phillips, of Cairo, reports in finding them in Arabia and in Egypt.

Caution in Examination.—Sir Patrick Manson said that due precautions must be taken in the study of patients as the operation of splenic puncture is not free from danger.

Tsetse Flies.—E. A. Austin, of the British Museum, read an interesting paper on the varieties of the genus *Glossina*, or tsetse flies. Since these had come into so much prominence as carriers of *Trypanosoma* infection, they demanded more detailed study.

(To be Continued.)

BOOK REVIEWS.

Taylor on Genito-Urinary and Venereal Diseases and Syphilis. A Practical Treatise for Students and Practitioners. By Robert W. Taylor, A.M., M.D., Clinical Professor of Genito-Urinary Diseases in the College of Physicians and Surgeons, New York. New (3d) edition. Revised and enlarged. Lea Brothers & Company, Philadelphia and New York.

In presenting the third edition of this standard work on Diseases of the Genito-Urinary tract, the Venereal Diseases and Syphilis, the author has carefully revised, and in many places rewritten the text, which is profusely illustrated throughout with many new engravings and plates, both in color and monochrome. In order to keep abreast with the advance in this department, Dr. Taylor has added many new and instructive sections, thus bringing the book up to date in every detail, which undoubtedly makes it the most modern, and at the same time the most conservative and satisfactory guide both for the practitioner and student, and at the same time a valuable reference book for the specialist, containing, as it does, a thorough and systematic account of all that is recent and progressive in this special field of work. The sections devoted to diagnosis and treatment, both operative and non-operative, are so comprehensive, conservative and practical in every detail, that the physician who carefully reads them will be fully prepared to diagnose and treat this large and highly important class of cases in a scientific and thoroughly up-to-date manner.

The publishers are to be congratulated on the general appearance and make up of the book, which is far in advance of anything that has appeared on these subjects in recent years.

The Clinical Study of Blood Pressure. By. Dr. Theodore C. Janeway, Lecturer of Medical Diagnosis, University and Bellevue Medical College. D. Appleton & Company, New York and London.

To have collected the immense mass of literature relative to the subject of blood pressure into one convenient and handy volume is the great service rendered by Dr. Janeway in this book.

He has classified the work under three heads, Physiological, Technical, and Clinical, giving a résumé of the important literature at the end of the book.

The author has abundantly shown the value of this information, and we cannot help feel that, for the first time, this important subject has been satisfactorily dealt with. The book is distinctly one worth having.

BOOKS RECEIVED.

State Board of Health of Massachusetts. Thirty-fourth Annual Report. 8vo, 623 pages. Massachusetts Board of Health.

Atlas Med. Grundriss der Hautkrankheiten. By Dr. Franz Mracek. 12mo, 115 plates, 284 pages. J. Lehmann, Munich.

Contributions from the Wm. Pepper Laboratory of Clinical Medicine. 8vo, 175 pages. Illustrated. University of Pennsylvania.

Elements of Water Bacteriology. By Drs. S. C. Prescott and C. A. Winslow. 12mo, 162 pages. Illustrated. John Wiley & Sons, New York.